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THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

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TRANSACTIONS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

CATCH-CROPPING IN SCOTLAND.

By Professor R. PATRICK WRIGHT, F.R.S.E., Glasgow and West of Scotland Technical College.

CATCH crops may be defined as crops snatched or caught from the soil between the ordinary or main crops of two consecutive seasons. If the main crop of one summer be oats and that of the succeeding summer be turnips, any crop that can be grown on the field between these is called a catch crop. In this sense the foggage that grows on a field and supplies keep to cattle or sheep for some weeks after the harvesting of lea oats might be called a catch crop. The term is, however, restricted in its use to crops sown for the express purpose, and as the foggage after lea oats is not intentionally grown, but is merely the result of the survival of pasture plants that have not been killed by the ploughing of the land for oats, it is not included under the designation catch crops. But if along with the oats there were sown seed of Italian ryegrass intended to occupy the land after the harvesting of the oats, and to supply keep for stock during some part of the autumn and winter in the interval before the land had to be ploughed again in preparation for a root crop, the Italian ryegrass would constitute a catch crop

It is well known that the practice of growing catch crops prevails very extensively in parts of the south of England, and constitutes there a prominent and important feature of arable agriculture. In the northern parts of England and in Scotland the practice of catch-cropping is confined within much narrower limits, and in many districts it is wholly unknown.

Influence of Climate.

The difference of practice between South and North in this respect, like most well-established agricultural practices, is due to differences in the conditions, which necessarily exercise a predominant influence on the courses of cropping followed and the nature of the crops grown. In this case the difference is chiefly one of climate. The features of the climate which affect the practice of catch-cropping, and control its range of possibilities, are the comparative durations of the summer and the winter, and the average temperature that prevails throughout these seasons. Other things being equal, a warm summer temperature promotes more rapid growth, and makes possible a shorter period of occupation of the land by any particular crop. It leaves, therefore, more time during the remainder of the summer for the growth of any other crop. The greater length of the summer adds to this advantage, and increases the possibilities of growing a second crop during the only period of the year when a vigorous second growth is possible. A comparatively high winter temperature is obviously favourable to catch crops that are intended to occupy the ground during the whole winter season and to be consumed in spring, while a severe winter climate is necessarily prejudicial, and limits narrowly the kinds of crops that can be safely left to occupy the ground during that season of the year.

Long and warm summers followed by short and mild winters present, therefore, the most favourable conditions for the practice of catch-cropping. These conditions prevail in general in a much greater degree in the southern than in the northern parts of the kingdom. Almost the directly converse conditions are the ordinary rule in Scotland. Our climate is commonly characterised as severe. Often it is late in spring before there are any signs of growth to be seen in pastures or other farm crops. Not infrequently, in the more elevated districts, the spring months of the calendar are entirely over before vegetation has made any visible start in growth. The summer is also shorter than in the South, and the average temperature is low. Often at the end of summer the further growth of crops is suddenly and prematurely stopped by the early setting in of severe autumn weather. It is not uncommon in the later districts of the country to find that the oat crop, hardy and adapted as it is for a cool climate, has been unable to complete the ripening of its seeds through the want of sufficient warmth, and has to be brought into an unnatural and dwarfed maturity by the action of frost. In some seasons the growth of the potato crop is brought to a premature close by the occurrence of frost while the tubers of the plants still fall far short of the size to which they are capable of growing, and this occurs on low lands as well as in the more elevated districts. The yield of the turnip crop every year is more or less determined by the nature of the weather in autumn. Only in a rare and exceptional season is the crop allowed to develop its bulbs to the full extent of which they are capable. Usually the yield is kept far below the maximum by the unfavourable character of the autumn weather.

In view of these facts it is not at all surprising that the practice of catch-cropping should at present occupy a very unimportant position in Scottish agriculture, as compared with the prominent place it holds in the agriculture of the south of England. In the rotations of the South are included numerous crops grown as catch crops that are practically unknown to the great majority of Scottish farmers. Only a very few farmers in Scotland have attempted to cultivate, or have even seen all such crops as rape, mustard, winter vetches, winter rye, thousand-headed kale, trifolium, and other crops which occupy important and useful positions in the cropping rotations of the South.

Extent of Catch-Cropping in Scotland.

Nevertheless, in spite of the generally unfavourable characteristics of our climate, the practice of catch-cropping does prevail to a limited extent in Scotland, and in one or two districts forms a somewhat prominent feature of the courses of cropping followed. There are unfortunately, however, no means of ascertaining the exact area on which catch crops are grown. The agricultural statistics contained in the Government Returns afford no assistance *Rye*, for example, which is one of the favourite catch crops in England, is cultivated, according to these Returns, on more than 8000 acres in Scotland, but there is nothing in the Returns to indicate whether this acreage is wholly occupied by rye as an ordinary grain crop, or whether on a part of the area covered by it the rye is grown merely as a forage or as a catch crop. From other sources of information it may be inferred, however, that rye is grown as a catch crop in Scotland only on isolated and occasional patches, and that its cultivation for this purpose is not at all extensive.

Rape, on the other hand, is one of the most extensively grown catch crops in Scotland, but in the Government Returns it is bracketed with cabbage and kohl-rabi, and there is no indication as to what proportion of the 10,000 acres occupied by these crops can be assigned to rape alone.

The *cabbage* is grown both as a catch crop and as a main crop—chiefly the latter—but there are no data to show what number of acres ought to be assigned to it under either or both of these headings.

The *vetch* crop, which is another very widely grown and important catch crop in England, also occupies, according to the Returns, nearly 11,000 acres in Scotland; but it is impossible to determine on what proportion of this large area the vetch is cultivated as a summer forage crop, and on what part it consists of a catch crop of winter vetches sown in autumn and consumed in spring in time to make way for a regular summer crop.

There are no other statistics available that throw any light on the question. But the kindness of correspondents in various parts of the country, who have sent replies to inquiries addressed to them, has enabled me to arrive at the conclusion that catch-cropping in Scotland, as an important and regular branch of farm practice, is confined almost exclusively to two districts of the country, and that in all other localities the attempt to grow catch crops is either very occasional or is confined to very limited areas. Perhaps more or less all through the kingdom occasional experiments in catch-cropping have been tried on a small scale, but these do not appear to have been followed by any serious and sustained attempt to include catch crops as a regular feature of the rotation. The districts in which catch-cropping constitutes a regular and established and somewhat extensive practice are those only where early potatoes are grown.

Ayrshire Catch-Cropping.

The earliest district in Scotland for this purpose is a strip of land running along the South Ayrshire coast in the parishes of Kirkoswald, Girvan, and Ballantrae. Tracts of land almost as early occur also over limited areas along the sea-coast in North and Central Ayrshire, in Wigtownshire, in Bute and Arran, and in the south of Argyll. In some districts in the Lothians also, the potatoes, though as a rule later in getting into the market than those of the West Coast, are raised in time to allow a catch crop to follow.

The favourite catch crops on the West Coast are rape, mustard, barley, Italian ryegrass, and white turnips. Mixtures of one or more of the first four of these are also occasionally grown, and other crops, like trifolium, have been tried experimentally. The common kale is also sometimes planted. All these crops are sown or planted in the fields as soon as possible after the raising of the potatoes, and usually, therefore, in the months of July and August. They are ready for use in the autumn months, and in general are completely utilised not later than the succeeding Christmas.

With two exceptions the crops grown on the Ayrshire coast are intended for consumption by stock. Some of them, like rape and Italian ryegrass, are commonly consumed by sheep on the land where they are grown. Others, like barley, are cut after they have attained the maximum growth that the season permits, and are removed to the farm-steadings to be fed to cows and other cattle. Sometimes the barley, after potatoes, is capable of growing to maturity and of yielding a crop of grain, which, though usually of light weight, is quite suitable for feeding purposes. When this occurs the barley is treated like an ordinary grain crop. The exceptional crops are mustard and kale. The latter crop is grown after potatoes, not for consumption on the farm, but for sale into the towns, and it therefore constitutes a market-gardening crop. Mustard, on the other hand, is frequently grown to be ploughed into the land as a green manure after the plants have attained their full size. It is not regarded as a very good feeding crop for sheep, but as it produces in a very short time a large bulk of forage which can be easily crushed down by rollers and covered in by the plough, it forms a very suitable crop for the purpose of green-manuring light land.

The Practice in the Lothians.

In the Lothians the selection of crops for catch-cropping purposes is in large measure determined by the proximity of the city of Edinburgh. Catch crops are not generally grown there, as in Ayrshire, for consumption on the farm, but for sale in the Edinburgh market. The preference on some farms is, therefore, given to the Golden Stone turnip, a small and quick-growing turnip that yields roots suitable for shopping purposes, and also to varieties of cabbage adapted for sale for human consumption. But the favourite and the chief catch crop grown in the Lothians is Italian ryegrass.

In an article by the editor of the 'North British Agriculturist' it is said: "In the Tranent district some of the farmers make a practice of taking an early crop of potatoes, and as soon as the crop is lifted sublet the land in question to market-gardeners for the growing of cabbage plants, which are all out of the ground in April in time to let the next year's crop be sown in good season. This system is also followed to a considerable extent in the Musselburgh district. A number of farmers follow up their crops of early potatoes with a crop of late-sown turnips—the Golden Stone variety being most generally used for that purpose. These turnips, if they be got sown in the early part of July, and the 'fall' be good and open, grow to be a fine crop, and are often sold to market-gardeners at as high as £8 per acre. In the immediate vicinity of Edinburgh, also, there is a good deal of catch-cropping, mostly after early potatoes. Generally in the Edinburgh district, the land from which a crop of early potatoes has been lifted is at once sown down with Italian ryegrass. This crop yields a good bite for sheep in the late autumn weeks if the weather be dry and favourable, and if not too closely eaten down in the 'fall' it is invariably ready for cutting in spring a fortnight earlier than new grass following a crop of barley."

The high favour in which Italian ryegrass is held in the neighbourhood of Edinburgh is due to the keen demand that exists, all through the summer, for green-cut Italian for the town dairy stocks. The Italian, after potatoes, is properly enough a catch crop, in so far as it gives a considerable yield of produce between the harvesting of the early potato crop and the crop of the next summer. But the main crop of the summer is also the Italian, which, after its autumn's grazing, is left untouched till spring, when it is let by public auction to city dairymen. Their practice is to take from it three or four cuttings of green forage during the summer, and after each cutting large dressings of nitrate of soda are applied, which promote a quick growth, and very large cuttings of grass are thus obtained. In the Ayrshire districts, when Italian is sown after the harvesting of the potato crop, it is usually ploughed down again during the winter, and is not allowed to remain as the main crop of the succeeding summer. Sometimes, however, mixtures of grasses suitable for several years' grazing are sown after the potatoes, and this practice corresponds with that of the Lothians in making the catch crop of the autumn the main crop of the following year.

Outside, however, of these comparatively small areas on which early potatoes are grown, the growth of catch crops can hardly be said to hold, in any district in Scotland, a recognised position as a regular and important branch of arable husbandry. An exception must of course be made of farms situated in the immediate neighbourhood of large towns or cities, where the courses of cropping followed have something of the character of market-gardening. Elsewhere in Scotland catch crops are only occasionally and rarely to be seen, and that only in small and restricted patches.

My correspondents in other parts of Scotland are, as a rule, able to refer only to isolated experiences with a few acres of one or other of the catch crops. Winter vetches, rye, and rape have been the crops most frequently tried. One correspondent has experimented with trifolium, but though his experiment proved fairly successful he has never repeated it. The other three crops have been tried more extensively, and in many instances with success; nevertheless, the practice of growing them does not appear to have extended. In most cases the catch crops have been grown for some special purpose, and they have been grown more frequently on the home farms of proprietors, who are less affected in their practice by considerations of profit and loss, and much less frequently by tenants, with whom the question of profit or loss is the first consideration.

So far, therefore, as concerns the general position of Scottish agriculture outside of the special districts and the particular circumstances that have been referred to, it would appear that catch-cropping under the unfavourable conditions of our climate is regarded by farmers in general as either impracticable or unprofitable, or both, and that its practice is therefore considered unsuitable for adoption into our regular cropping rotations.

Worthy of further Trial.

The inquiries that have been made in the preparation of this paper have, however, elicited a number of facts which afford some ground for hesitation in accepting this conclusion. It is certainly open to question whether the trials of catch crops that have been made have been carried out with an adequate knowledge of the requirements of the crops under experiment in the special circumstances in which they were grown, and it is also greatly open to question whether the trials made have been varied enough, or continuous enough, to warrant any decided conclusion at all. The instances of success have been so numerous as to warrant at least the expectation that still greater success is quite possible of attainment. There can be little doubt, at any rate, that in the opinions formed as to the profit or loss of catch-cropping, no consideration has been given to a number of the most important advantages resulting from its practice. Of a number of these advantages it is unfortunately impossible to calculate the exact money value, nor even to make a very close approximation to it. But they are, nevertheless, of a very important and valuable character; and as they seem to be very generally overlooked in the consideration of this subject, it may be of some service to devote a little attention to them.

Advantages of Catch-Cropping.

The first advantage of the practice of catch-cropping lies, of course, in the direct return of crop obtained. That return, according to the particular practice followed, is available either in autumn or in spring in the form of green food suitable for consumption by sheep in the fields where it is growing, or adapted for cutting and carrying to the steading to feed cattle. In some instances, as in the case of cabbages and kale, the crop may be available for direct sale, and in such circumstances the amount of return can easily be calculated. Rape and Italian ryegrass are chiefly consumed by sheep in the fields in autumn. Rye, as a rule, affords little or no autumn keep, but it is ready for cutting in spring to feed cattle. The value of the produce obtained varies greatly from year to year, according to the time of sowing and the nature of the weather in autumn and in spring. But there should be no great difficulty in the average of years in forming a fairly correct estimate of the value of the produce obtained, and of comparing it with the costs of seed and of tillage incurred. It must not be overlooked that a moderate return in crop will easily repay the total cost.

In the growth of catch crops the expense of cultivation is in nearly all cases exceptionally low. Where a catch crop is introduced as a new feature in a rotation, a charge for rent cannot properly be made against it in estimating its cost. With or without the catch crop rent and taxes have to be paid, and they are properly, therefore, charged against the ordinary and main crop of the year. The costs of tillage are also low, because the fields have, as a rule, been so well tilled for the preceding crop that only a minimum cultivation is required for the catch crop, just as much as is needed to provide a suitable surface tilth for the reception of the seed. The costs of seed and of a slight tillage remain, therefore, in most cases, the chief items in the list of expenses, and a moderate return in crop suffices to repay them in full.

Neither is there any charge to be made for manures; for catch crops are supposed, as a rule, to be sufficiently provided for in such "condition" as is to be found in the soil either from the residue of previous manuring or from natural fertility. Catch crops grown for direct sale are exceptional, as they do occasionally receive special dressings of manure; but it is certainly worthy of consideration whether catch crops could not always be grown more successfully, and therefore more extensively, if they were assisted by direct applications of manures suitable to their character, and likely to hasten their growth. It is not at all impossible that some failures that have occurred have been due to the lack of such treatment, and that liberal and suitable manuring would have ensured success where the results have been hitherto regarded as alike unsuccessful and unprofitable.

Special Manuring necessary.

Indeed special manuring suggests itself at once, by the very nature of the conditions under which catch crops are grown, as an absolutely essential feature in their cultivation. Yet this necessity seems to have been universally overlooked. Catch crops must obviously be quick-growing crops. Rapidity of growth is the special feature that fits any crop for the purpose, for only a limited time is available for growth, and in that time as large a yield of forage as possible is desired. Moreover, during their whole period of growth catch crops have to contend with adverse conditions of weather and temperature, and it is a foregone conclusion always, that sooner or later in the winter their growth must be brought to a premature and absolute cessation. For crops struggling against such an adverse combination of circumstances, it is clearly essential that all controllable conditions should be rendered as favourable as possible, and a condition which is fully under control, and which exercises a powerful influence on the growth of all crops, is that of the richness or poverty in readily available plant foods of the soil in which the plants are growing. No one who has seen catch crops grown in autumn on two fields, of which one was in high condition and one in low, could fail to notice the remarkable difference in the rapidity of growth of the two crops, and in the bulk of the produce ultimately obtained. The presence of "condition" clearly enables the crops to struggle with much greater success against the depressing circumstances incident to the lateness of the season of growth.

But the "condition" awanting in any soil can easily be supplied for the purposes of catch-cropping by the application of readily available artificial manures. For this purpose the slow-acting manures are of little value. Neither farmyard manure nor bones nor any slow-acting artificials are suitable. Quick-acting artificials, like superphosphate and nitrate of soda, are the appropriate manures for such crops, each or both of them being employed according to the kind of crop. For leguminous catch crops the potash manures are invaluable, but, as they are of slow diffusion in the soil, it would probably be better to apply them in excess to the preceding main crop, and to allow the catch crop to benefit by their residue.

Manurial Value.

If the food obtained by the growth of catch crops constitutes their first value, the second is obtained through the manurial value of the crops and their residue. The growth of such crops and their consumption on the holding yield a very considerable quantity of vegetable *débris* and of manure. This residue is greater in amount and has a greater value than is perhaps usually supposed. A crop of rape or mustard grown in autumn and consumed on the ground by sheep has a very enriching effect on all soils; and on light soils especially, the addition of the organic matter contained in the droppings of the sheep and in the *débris* and decaying roots of the crop has a prolonged beneficial influence on the productiveness and fertility of the soil. Apart from the manurial effects, the mere consolidation produced by the treading of the sheep while they are consuming the growing crop is of distinct advantage on light and open soils.

But it is also to be remembered that animals, after all, only retain in their bodies a very moderate proportion of the valuable manurial ingredients contained in the crops they consume, and that much the greater part of the nitrogen, phosphates, and potash in their food is returned to the soil in the liquid and solid excrements. When a crop is consumed by sheep on the land where it has grown this restoration is accomplished with a comparatively slight loss or diminution. The removal of fertilising ingredients in the bodies of the animals is far more than repaid to the surface soil by the valuable elements brought up from the subsoil by the deeper roots of the plants, by the beneficial influence exercised both on soil and subsoil by these roots alike in their growth and their decay, and by the general enrichment produced by the large additions of liquid manure and of solid excrement discharged on the surface soil. Hence it is that the consumption of any crop on the land where it has grown has become a well-recognised means of adding to its fertility and productiveness. When a crop is not consumed on the ground, but is cut and removed to the steading to be given to cattle, the advantages to the field where the crop grew are in great measure lost, though it still benefits by the decaying *débris* and roots left in the soil. But what the field otherwise loses is gained in great measure by some other part of the farm to which the manure made at the steading may be afterwards applied. But there is another residual effect of great importance produced by the growth of a certain class of crops to which no reference has yet been made.

Enriching Effects of Leguminous Crops.

Modern agricultural science has shown how certain catch crops, instead of exhausting the soil of its most valuable ingredients, have a recognised power of enriching it in the most costly substance supplied in manure, viz., in nitrogen. This power in agricultural plants is possessed only by the leguminous (papilionaceous) crops, and it gives a very special importance to all crops of that class. Of these the only plants that have taken a position of any importance in Scottish agriculture are the bean, the vetch or tare, and the clovers; but on account of this special property, other leguminous crops, such as lucern, may be deserving of greater attention at the hands of Scottish farmers than has yet been paid them. The growth of such crops, whether they have been consumed on the land where they were grown or removed from it, leaves in the soil a quantity of decaying roots rich in nitrogen, of which the greater part has been derived from the atmosphere through the agency of bacteria contained in little nodules on the plant roots. The cultivation of any of the papilionaceous plants as catch crops is, therefore, a direct means of enriching the soil in nitrogen, on which succeeding crops may feed, and it does away with the necessity for such a liberal and costly employment of nitrogenous manures as would otherwise be necessary.

Preservation of Nitrates.

But while the restoration of nitrogen to the soil is a benefit that can only be conferred on it by papilionaceous plants, plants of any kind that occupy the ground are capable, if not of restoring, at any rate of economising the nitrogen in it, and of preventing its loss. Nitrogen in the soil exists for the most part in the form of insoluble organic compounds, of which no loss can very readily occur. But in soils in which the nitrifying bacteria are at work under suitable conditions, there is a constant conversion going on of the insoluble organic nitrogen into the form of soluble nitrates. In this latter form the nitrogen is readily taken up by plants, but in the absence of plant roots to utilise it, it is also readily washed into the drains and totally lost. In one part of our ordinary cropping rotations this loss to the soil is especially heavy. The process of nitrification goes on most rapidly during the warm summer months, as summer temperatures are most favourable to it, and during the low temperatures of winter the process falls to a minimum or ceases altogether. The soil is therefore poorest in nitrates in the middle and end of winter, and richest in nitrates in summer.

In the growth of corn crops the nitrates formed in spring and early summer are readily taken up by the young plants during their primary and secondary stages of growth, and probably little waste of nitrates by drainage is incurred. But in the latter part of the summer, as the crops approach the ripening period, their demand for nitrates steadily diminishes, and finally, when they have become mature, it entirely ceases. There then occurs an accumulation of nitrates in the soil, because there are no growing plants to utilise them, except when the corn land has been sown out with seeds. After harvest there is nothing to prevent the nitrates from being washed entirely into the drains during the wet months of autumn and winter. Usually the rainfall is heavier in the autumn months than at any other period of the year, and as the greater part of the rain on a cultivated and properly drained and bare soil passes through the soil to the drains, it takes with it the nitrates that have accumulated during the later weeks of summer. This drainage of nitrates from uncropped lands during the autumn is undoubtedly one of the most potent causes of the great exhaustion in nitrogen that is liable to occur on cultivated soils under regular rotations of cropping in wet climates, and it necessitates a liberal use of costly nitrogenous manures, if good crops are to be grown and fertility maintained. For the purpose, therefore, of keeping down expense in manures, and at the same time of maintaining unimpaired the condition and productiveness of the land, it is evident that the prevention of this loss of nitrates is very important.

There is, however, no known means either of preventing or of diminishing this loss save by the growth of crops, by which the land is occupied by actively growing plants during the wet months of the autumn. The preservative action exercised by such crops is of a twofold character. The nitrates directly taken up by the roots of the growing plants are saved from loss through the drains, and for this purpose the deeper-rooting crops are obviously the most effective. Other things being equal, deep-rooting crops are therefore to be preferred for catch-cropping purposes. But catch crops also preserve nitrates in the soil, altogether apart from those utilised in their own growth, by diminishing, as they do very materially, the amount of rain-water that passes through the soil to the drains. On uncropped lands a much greater quantity of water passes into the drains than on cropped land. On the latter a very large proportion of the rainfall is transpired by the crop. The total volume of water passing to the drains is thus greatly reduced, and the quantity of nitrates washed away and lost is correspondingly diminished.

When due consideration is given to all these effects resulting from the cultivation of catch crops, it becomes obvious that the mere food value of the catch crop itself constitutes only one of a series of advantages, and that the total cumulative effects of the practice possess a much greater value as a means of maintaining the fertility of the soil than at first sight appears. Too much stress can hardly be put on the great advantage derived from the addition to the soil of a large quantity of organic matter in the *débris* and roots of catch crops, the direct enrichment in nitrogen produced by the papilionaceous crops, and the economy of nitrates effected by the reduction in the amount of rain allowed to pass into the drains. These secondary, but very important, results do not appear to have received much consideration, even from those who have given most attention to the practice of catch-cropping. Hence, while the practice has in a good many instances received such a fair trial in Scotland as to test sufficiently its practicability and convenience, estimates of its economy, which have been based solely on the direct return in food, without regard to the indirect advantages realised in other forms, have clearly given a wholly erroneous impression on the vitally important question of profit and loss. The indirect advantages alone seem sufficient to warrant an extension of catch-cropping in Scotland whenever the possibility exists of getting moderately good crops to grow, and this even if the more general adoption of the practice involved, as it necessarily must, an increase both in the labour and expenditure of the farm.

Practical Advantages.

Apart from the effects on soil and fertility, the practical advantages in arable and stock farming gained by having a portion of the land under catch crops are by no means inconsiderable. It cannot, perhaps, be claimed for catch crops ready for use in autumn, that they supply green food either for cattle or sheep at a time when other foods would be unavailable, because at that season of the year roots and fodder are usually available in plenty. Some of the catch crops may, however, so far take the place of roots as to allow the growth of the latter to be continued for a longer period in an open autumn, and to permit their consumption to be avoided while they are still in an immature and therefore somewhat unwholesome and less nutritious condition. Moreover, catch crops in early autumn are more suitable for many purposes than are turnips. The objectionable flavour given by roots to milk may be entirely avoided if the cows can be supplied instead with green cut barley or ryegrass. Lambs will not fatten so quickly or so surely on turnips as on rape, nor can toothless ewes be in any way more conveniently fed than on crops like ryegrass and rape, which do not require to be cut or put into troughs for them as is the case with turnips.

The growth of autumn catch crops may also have a very important effect on the labour economy of a farm, because it may thus be made possible to reduce the area of land devoted to the cultivation of roots, without diminishing the total amount of green food available to keep stock during autumn and winter. This implies, of course, in one aspect, a corresponding reduction of labour and of expense.

It is, however, in relation to the spring supply of food that catch crops are more especially serviceable on stock farms. The late spring is a period when keep for stock is almost invariably scarce. Fodder and roots are often alike exhausted before there is any sufficient growth of fresh pasture. Swedes, if any remain, have by that time lost their freshness, and are no longer palatable to stock. Fodder is apt to be dry and distasteful. If the spring be unusually late, cattle and sheep alike are left to wander over bare pastures, feeding as best they can on "fresh air and fine views." A suitable catch crop coming into readiness for use just at the time of greatest scarcity is of such advantage as to have a much higher than its ordinary intrinsic value. For all milking animals a supply of green and succulent food at this period is of the greatest importance. Recently calved dairy cows will suffer in their yield of milk throughout the whole season if it be allowed to fall off soon after calving through want of proper feeding, and nothing is more suitable for maintaining its flow than a supply of such a food as green rye or Italian ryegrass. For milking ewes these crops are equally suitable, and if early fat lambs be wanted, they are all the more desirable. They are, however, equally well adapted for all kinds of live stock; and in a late spring, when fodder and roots are alike exhausted, and when pasture is slow of coming, they may be the means of preserving stock from a serious and even a disastrous loss of health and condition.

The Labour Question.

As against these numerous and important advantages attending the practice of catch-cropping there remains to be set a serious practical disadvantage, which has perhaps operated against the extension of the system to an even greater degree than the unfavourable conditions of our climate. No additional cropping can be done without involving extra field work, and extra field work requires the employment of more labour, both of men and of horses. Farms, however, as a rule, are equipped only, and properly, with the minimum number of men and of horses needed for the ordinary and established systems of cropping. On no well-managed farm are there more men or more horses than are absolutely necessary for the regular work of the farm. Perhaps in these times, when every effort is being made to economise the labour bill and to reduce expense, farms are more frequently to be found on which the horses kept and men employed are barely sufficient for the work to be done. No additional strain can be easily borne, and none, therefore, is attempted. The growth of catch crops necessarily causes more work, and if the resources of the farm are not sufficient to overtake it, the results must prove unsatisfactory. Only annoyance and disappointment can accrue from any attempt to grow more crops than can be properly cultivated, and no advantage resulting from catch-cropping would form sufficient compensation, if it could only be obtained at the cost of undue delay in the regular working of the farm.

But if the practice of catch-cropping were once established as a regular part of the rotation, the difficulties due to this dislocation and derangement of labour would soon disappear. Extensive catch-cropping would necessarily involve the employment of more men and the keeping of more horses. It implies a more intensive system of farming, and adds alike to the crop-producing and the stock-keeping capacity of the farm, and it, therefore, necessitates also the employment of more capital. But the employment of more labour and the investment of more capital are not disadvantageous in themselves,—quite the contrary, so long as the capital is judiciously invested, and so long as it gives a remunerative return.

Moreover, the increase of labour involved in catch-cropping is not as a rule at all excessive, so long as the crops grown are consumed on the land. In the growth of rape, after early potatoes, when the seed is sown before the potatoes are raised and is covered in the digging, there is no labour involved except the mere distribution of the seed. Barley, rye, and some other crops require the preparation of the land by ploughing as well as subsequent and sufficient harrowing, but no more labour is needed till the crops are ready to be used. Against such extra labour has to be set the saving that would be effected if a corresponding reduction were made in the acreage under roots. An increase in catch crops and a reduction of the root crop area would, moreover, cause a better distribution of farm work throughout the year than at present prevails, and this would enable greater economy to be effected. The seed-sowing period would be more varied and extended, and the extreme pressure of work in spring, which forms a chronic difficulty on arable farms, would be lessened. On account of the greater variety of crops and their different seasons of growth, a greater regularity would also be attained in the average amount of available green food produced for stock, and the consequences of a partial failure of the root crop would be much less serious than they are at present.

Such results, however, can only be attainable with their full advantages when catch-cropping takes a recognised and fixed position as a regular part of the farm practice. In the isolated attempts that have been made to introduce the system into parts of Scotland where it is at present unknown, all the difficulties and inconveniences have been felt while the advantages could not be fully realised. These attempts have, however, shown the possibilities that exist for a more extensive introduction of catch crops into our ordinary rotations, and they have shown what crops are best adapted for the purpose under the prevailing conditions of our farming and our climate.

Crops suitable for Catch-Cropping in Scotland.

The crops that have been shown by various trials to be capable of a more or less successful growth as catch crops in Scotland belong to the three botanical orders—Gramineæ, Cruciferæ, and Leguminosæ.

To the Gramineæ belong Italian ryegrass, rye, and barley; to the Leguminosæ, vetches, trefoil, trifolium, and the clovers; to the Cruciferæ, rape, mustard, kale, cabbage, and white turnips.

Italian Ryegrass.

This is one of the crops most frequently cultivated in Scotland as a catch crop, and it has very great merits for that purpose. Good seed is always easily procurable, and it germinates readily at any ordinary temperature so long as the ground is moist. It can be sown at any time in the year, and it grows very freely and quickly. It responds well to suitable manuring, and if liberally treated gives a large amount of produce. It stands either constant grazing or repeated mowing, and its produce either in the green state or when made into hay is liked by all kinds of stock, and supplies them with a palatable and nutritious diet. It thrives perfectly in the Scottish climate, and it grows freely on all soils, provided only that they are in good condition or are well manured. It is suitable either for a main crop or a catch crop, and is frequently sown at one and the same time for both purposes. On account of its adaptability to all kinds of soils and its suitableness for the climate, it is one of the crops which could be most generally employed in Scotland in an extended system of catch-cropping. It is largely grown in Ayrshire and in the Lothians as an autumn catch crop after early potatoes, and it has also been tried after vetches, after cabbages, and after lea oats.

Italian Ryegrass after early Potatoes.

Italian ryegrass is one of the catch crops commonly sown after early potatoes. On the Ayrshire coast it is hardly so extensively grown in this position as some of the other catch crops, but it is the favourite crop after potatoes on early farms in the neighbourhood of Edinburgh. On these farms, however, the Italian, as has been already explained, is sown not merely as a catch crop to be ploughed down in the winter after it has been grazed for a few months by stock, but it is also usually left to form the main crop of the succeeding summer. Italian ryegrass thus sown after potatoes in summer, if not too closely grazed during winter, is ready for cutting in spring about a fortnight before grass that had been sown down in the preceding year with a barley crop. Not only has the autumn-sown Italian the much-valued advantage of yielding an earlier cutting to begin with in spring, but it has thus the further advantage of an additional period of two weeks for growth in the summer. A notable feature of merit possessed by Italian ryegrass, which, in that respect, renders it superior to all other autumn-sown catch crops, is the readiness with which it grows again after being cut or eaten. Other catch crops for the most part have to be left untouched by stock till they have attained a maximum growth, or, if consumed earlier, there is a diminished yield of produce. After they have been once eaten down most of them give again a very slight additional produce, if any at all. But Italian ryegrass can not only be grazed, but is even benefited by grazing before it has attained to its full growth. As soon as it affords a full bite stock can be turned into it, and as quickly as it can be eaten down it starts to grow again with renewed vigour. So long as its growth is not absolutely stopped by frost, and so long as the rainfall supplies it with sufficient moisture, as in autumn it seldom fails to do, it goes on producing fresh and nutritious keep. The amount of keep that Italian ryegrass is capable of producing when judiciously grazed, in an open autumn, is really remarkable. The total amount depends primarily, of course, on the condition or fertility of the land. On poor land Italian ryegrass, no more than any other crop, can give a large produce unless it be adequately manured. But its manuring is very easily managed. On ordinary soils nitrogen is its special requirement. Phosphates and potash are of course useful, but any soil that has been previously manured for early potatoes is likely to contain these minerals in fair if not in abundant quantity. Nitrogen may be the only substance needed in the manure, and it can be best supplied in nitrate of soda. Italian ryegrass gives a ready response to applications of this manure, and owing to the effectiveness and rapidity with which nitrate of soda acts on it, Italian ryegrass, properly treated with it, can be made to yield larger and longer-continuing supplies of green food than any other crop.

Mr John Hannah, Mains, Girvan, considers Italian ryegrass the most valuable of the catch crops grown after early potatoes. He finds the cost of seeding to be greater than is the case with some other crops, but the value of the produce is also greater. When sown early in July, the grass, if the weather be favourable, may be fit to pasture by the end of August; "and the amount of feed produced from that time till frost sets in is only limited by the condition of the land and the amount of rainfall." In a recent autumn Mr Hannah estimated the value of the sheep-feeding got from Italian on his land between 25th September and 26th November as equal to 30s. per acre, and considered that the further winter grazing might be regarded as paying the seed, which cost 5s. 6d. per acre. The chief drawback to Italian ryegrass on heavily manured land, Mr Hannah finds to be the dangerously purgative action it exercises on weak sheep or lambs. It can only be safely grazed by sheep of not less than one year old, in healthy and good condition.

Mr Matthew Wallace, Terreglestown, Dumfries, who has had much experience in the growth of Italian ryegrass both as a catch crop and a main crop, writes that it is best to have the land in good condition before seeding, and to rely solely on artificial manures for forcing. He tried top-dressings of farmyard manure on Italian ryegrass in the years 1886 and in 1895, but in both cases was much disappointed with the results. He found that as it was practically impossible to distribute the farmyard manure with perfect accuracy, patches of the grass were rotted out, and the plants grew irregularly. Moreover, the manure did not appear to have its nitrogen in a sufficiently active form for the growth of early green forage. He considers that an application in February of a mixed artificial manure containing nitrogen, phosphates, and potash, all in readily soluble forms, to be followed in March by a further application of nitrate of soda alone, is the most successful method of manuring. He has always found nitrate of soda the best source of nitrogen for Italian ryegrass. This opinion is fully corroborated by the practice of dairymen round Edinburgh, who, between each cutting of Italian ryegrass taken in summer, apply no less than 3 cwt. per acre of nitrate of soda. Mr Wallace has also found that liquid manure is very effective in forcing a rapid growth of forage.

The experience of farmers round Glasgow also shows, however, that nitrogen in a sufficiently quick-acting and effective form is supplied in the city ash manure, and also in moss-litter manure from stables. Both of these manures are of a friable and open character, and admit of a very complete and equal distribution on the surface of a grass turf; and the moss-litter manure in particular is very rich in nitrogen, in the readily available form of the urine which has been absorbed and retained in the litter. When such manures are available they can be used alone, or perhaps better in conjunction with nitrate of soda.

Amount of Seed.

The amount and kind of seed to be used in sowing out Italian ryegrass is a question of importance. It has more effect on the total weight of produce obtained than is perhaps generally supposed. A comparatively thin seeding may suffice for crops that are capable of spreading themselves gradually over the ground, and that are allowed sufficient time in which to do so. But for catch crops the period of growth allowed is always of the shortest, and it is obviously important that a sufficient quantity of seed should be sown to occupy the ground fully with young plants at the very commencement of growth, so that their energies may not be expended in efforts after a wider root extension, but may be more fully occupied in the rapid production of available forage. Thick seeding is probably best for all forage crops, and it is especially necessary for catch crops. Ordinary practice in this respect is variable, but we approve the opinion of Mr Matthew Wallace, who prefers four bushels per acre when the grass seeds are sown alone. Mr Wallace also strongly recommends the use of foreign Italian seed. It produces more vigorous and earlier plants than the home-grown seed, and on these grounds alone is clearly preferable for catch-cropping purposes.

Mr John Speir, Newton Farm, Glasgow, advocates deep covering of the seeds, and thinks a mistake is commonly made in sowing too shallow. He recommends that the seeds should be sown on a rough or partially harrowed rather than on a smooth surface. He believes that far more seeds germinate when planted deep than when shallow covered. The deeper-rooted plants stand drought better, and are less readily thrown out of the ground during alternate frosts and thaws. This, of course, is a consideration of less importance in an autumn catch crop than in a crop intended to occupy the ground for one or more years.

Italian Ryegrass with Cabbages.

Mr Speir has practised an ingenious method of using Italian ryegrass as a catch crop after cabbages, which appears to be worthy of imitation. Early cabbages are grown on a number of acres on his farm, and are cleared off the land and sent to the Glasgow market in July and August. Mr Speir manures his cabbage crop very liberally, and applies large dressings of nitrate of soda; and he found (as was also found in the Rothamsted experiments) that the nitrate gave great encouragement to the development of chickweed, which occupied the land very completely after the removal of the cabbages. It occurred to him that this pollution might be prevented by covering the ground with some quick-growing and vigorous plant, which would compete with and if possible smother the chickweed. He accordingly tried the sowing of the seed of Italian ryegrass among the cabbages about the middle of June. This plan has proved eminently successful. Not only is the chickweed kept in check, but the land, after the removal of the cabbages, remains covered with a sole of thick and vigorous grass, which continues to grow throughout the autumn, and affords a large amount of nutritious keep for stock. Not only on this method is a large amount of valuable keep obtained at a very trifling cost, but also the nitrate of soda which is not fully utilised by the cabbage plants is taken up by the Italian ryegrass; whereas on bare land much of it would be washed into the drains during the winter and wholly lost.

An important feature of this combination of crops is that the manure applied to the one is perfectly suitable for the other. A liberal general manuring is adapted both to cabbages and to Italian ryegrass, and both crops also respond readily to large applications of nitrate of soda. The amount of keep that is given by Italian ryegrass in an open autumn, under these conditions, is surprisingly great.

Italian Ryegrass with Lea Oats.

Land after lea oats is usually left bare till turnips or potatoes are put in to occupy the ground in the following summer, and during the intervening autumn and winter there is a great waste of nitrates washed into the drains. That the total loss of nitrogen from this cause is very great may be readily inferred from the fact that there are more than 600,000 acres of lea oats grown in Scotland, and that over almost the whole of that vast area the land is left bare from the time of harvest till the following spring. It is at this point in the ordinary rotation, if anywhere, that a more extended growth of catch crops seems especially desirable, with a view to the preservation of the nitrates and the maintenance of the fertility of the land. The lateness of the Scotch harvest and the shortness of the period that intervenes between it and winter have, however, placed serious difficulties in the way of finding crops suitable for occupying the land at that time. These difficulties have been perhaps most successfully met by the practice, which has been tried in a number of cases, of sowing Italian ryegrass with the oats in spring and allowing it to occupy the ground after harvest till the land has to be ploughed.

Mr R. Shirra Gibb, Boon, Lauder, writes that he has tried the plan of sowing Italian ryegrass with his lea oats, and his experiment was attended with moderate success. His farm is largely a sheep-breeding one, and it is situated at an elevation of from 700 to 900 feet above sea-level. It occurred to him, considering the advantages of clean good pasture for ewes during the period the rams are with them and for a fortnight or so before, that if he could increase the acreage in seeds, and put his ewes on them after the corn crop was off the ground, the increased crops of lambs would pay the seeding, and save other pasture and perhaps extra feeding. With that object in view, he sowed along with his oats after lea about 1½ bushels of Italian ryegrass per acre. He did this for two years over an area of about twenty acres each year. There was quite a nice cover of Italian grass after harvest in both years. But he did not consider that the number of ewes kept paid the cost of seeding, and he abandoned the practice. He attributes the comparative failure on his farm—no doubt correctly—to the high elevation and the usually late harvest; but is of opinion, judging from his own experience, that the practice might be profitable on an early and clean farm, where six weeks' autumn keep of the best kind might be got either for tupping ewes or for broken-mouthed ewes.

This opinion finds emphatic support in the experience of the Rev. Dr Gillespie, of Mouswald. In the spring of 1898 Dr Gillespie had a field of lea oats on medium land, on which one bushel of Italian ryegrass seed was sown with the seed-corn. Through an error on the part of the ploughman, the ryegrass seed was not harrowed in but only rolled, and for that reason it brairded somewhat irregularly. The oat crop was an exceptionally heavy one, both in grain and straw. Some of it was lodged before harvest, and a part has since been threshed which has yielded at the rate of 75 bushels grain per imperial acre. In spite of the irregular brairding of the ryegrass, and of the heavy and exhausting oat crop taken from the field, a large amount of keep has been obtained from it. The area of the field is 14 imperial acres, and on this acreage 116 lambs have been kept intermittently for a week at a time, as well as some cows and calves. Reckoning the value of the lambs' keep at 3d. per week, and making a moderate allowance for the cattle, Dr Gillespie estimates that from harvest up till 8th November he has got keep from the field of the total value of £5, 15s., or rather over 8s. per acre. The seed cost 2s. 6d. per bushel, or in all £1, 15s.: there remains, therefore, a large profit.

Moreover, the field, which is to be again sown out with oats, is not to be ploughed till February, and it will be available for further grazing during the winter. One marked advantage of this, as Dr Gillespie points out, is that the ordinary sheep-pastures can from time to time be cleared of stock and allowed to become fresh and clean. Dr Gillespie believes the system to be suitable for early districts, but is of opinion that a somewhat thicker seeding might probably be advantageous.

In this case the trial of the Italian ryegrass was made on low-lying land, in a somewhat mild district of the country, and was more successful than Mr Gibb's; but the experience of the latter at Lauder, though less profitable, was of much importance, as showing that Italian ryegrass can be successfully grown in this manner up to a considerable elevation in a cold and late district in the east of Scotland.

There is a very extensive acreage of arable land, more especially in the west of Scotland, situated more favourably than that at Lauder, alike as to elevation, temperature, and amount of rainfall, for the growth of autumn forage crops, on which probably much better results could be obtained. Even on high-lying, late, and cold farms, the practice of sowing Italian ryegrass in this fashion might be considered profitable if a due value were placed not only on the returns obtained from the grazing, but on the preservation of nitrates, and on the value of the manure obtained from the consumption of the ryegrass, and the burial in the soil of its *débris* and root residue.

A possible Objection.

It must, however, be noted that there is another effect produced by sowing Italian ryegrass with oats which is not altogether advantageous. What is the effect on the yield of the oat crop? It cannot be altogether beneficial. The grass is a rapid grower, and its roots compete vigorously in the soil with the oats for nitrates and phosphates. Moreover, the grass plants take up and transfix much water, and diminish the supply available for the corn. In a dry year and on light soils this may be a somewhat serious disadvantage, and it can hardly be doubtful that the growth of grass with the oats must tend to reduce the yield of the latter crop. To what extent this may be the case cannot be estimated, and no doubt the effect will vary from year to year. There is, unfortunately, no experiment station in Scotland, supported, as in America and in Germany and other countries, by large endowments from Government, at which investigations into questions of practical importance such as this can be carried out. The observations of farmers teach a great deal, but exact calculations of profit and loss cannot be based on loose observations. The general inferiority of the sown-out oat crop to the lea crop is, however, well known. But no one is in a position to say, so far as our published knowledge indicates, how far that inferiority is due to the influence of the young seeds growing with the crop. This consideration undoubtedly suggests, however, that it would be preferable for this purpose to sow with the oat crop some plant which would not compete with it so keenly for nitrates as Italian ryegrass undoubtedly does. The ryegrass and the oat belong to the same botanical order, they have somewhat similar habits of root growth, and they make a demand on similar plant foods in the soil. Both specially need nitrogen, both demand a full supply from the soil, and both take up nitrates greedily. A plant of a different root character, and one that did not require nitrates from the soil in such quantity, would clearly be preferable.

Could Clovers be substituted?

The leguminous forage plants at once suggest themselves for this purpose, not only because they are largely independent of nitrates in the soil, and are of different habits of root growth, but also because of their well-known power of collecting nitrogen from the atmosphere, which remains in their roots to enrich the soil for subsequent crops. The clover plants are the most commonly grown, but there is little evidence to show which of them would be most suitable, nor what amount of keep they would afford during the autumn months. They do not appear to have been tried in Scotland for this purpose. But it may be assumed with confidence that the amount of autumn keep to be got from clovers would be much less than from Italian ryegrass, however superior might be the effect on the soil or on the grain crop.

Canadian Experiments.

On the latter point some very interesting experiments have been carried out on the Central Experiment Farm, Ottawa, Canada, under the superintendence of Dr Saunders, the results of which are in some measure applicable to this country. The experiments were begun in 1895, and were continued in 1896 and in 1897, and their object was to determine whether the sowing of clover seeds with the grain lessened the yield of the latter, and if not, what variety of clover and what quantity of seed would be most suitable for growing as a catch crop after grain. On the primary question of the influence exercised by the clover on the yield of the grain crop, the results obtained, though somewhat contradictory and variable on the different contrasted plots, were on the whole reassuring, and Dr Saunders' conclusion is that on the average the growth of the clover with the grain crop does not produce any deleterious influence on the yield of the latter. On the question of the manurial advantage to be gained from the sowing of clover with grain, a series of experiments were carried out in 1897, of which the following may be quoted.

A number of plots, all on sandy loam, were sown with oats and with barley along with varying quantities of clover seeds. At the end of the season, at the dates stated, small areas in these plots of 16 square feet were dug to a depth of 9 inches, and all the roots and tops of the clovers were carefully gathered and weighed. The highest and lowest weights of roots were obtained on Plots 5 and 8 as follows:—

Plot 5. Sown with Odessa barley, 6th May, with 4 lb. mammoth red clover per acre. Dug 20th October.

	Tons	lb.
Weight of clover leaves and stems per acre . .	2	1445
Do. roots per acre . . .	2	1105
Total .	5	550

Plot 8. Sown with Odessa barley, with 8 lb. mammoth red clover per acre. Dug 20th October.

	Tons	lb.
Weight of clover leaves and stems per acre . .	3	934
Do. roots per acre . . .	3	40
Total .	6	974

When due consideration is given to the highly nitrogenous character of the clover plant, it would seem to be clearly enough shown by these trials that the growth of even a moderate clover crop produces a total quantity of root residue which must tend very greatly to the enrichment of the soil, and that it is at least possible that the sowing of clover seeds with our lea corn might in many cases be profitable for this purpose alone, apart from any question of the value of the food obtained.

In the Canadian experiments alsike clover and lucern were tried on some of the plots as well as red clover, and the common yellow clover or trefoil might also deserve consideration. In England it is extensively grown as a catch crop on chalk soils and on marls, being sown with wheat in spring, grazed in autumn, and again cut or grazed in the following spring before the land is broken up for turnips. Quite probably a mixture of these plants might give better results than any one of them sown alone.

Rye.

Various attempts have been made in Scotland to utilise the rye as a catch crop, and a fair measure of success has attended them. It does not grow so rapidly as some of the other catch crops, and hence, though the seed is sown in the late summer or early autumn, it is especially for use in early spring that the crop is grown.

Mr Walter Ovens, Torr, Kirkcudbrightshire, in 1895 sowed five acres with rye mixed with a few tares, the date of sowing being 11th October. The previous crop was beans. The rye was top-dressed in March with nitrate of soda, and a part of it, intended to be first cut, was again top-dressed in April. About the end of April cutting commenced, and the rye was given to cattle, which did well on it. The part first cut afterwards yielded a second cutting. In the succeeding month growth was so rapid that two acres were cut on 19th May and made into hay. The length of straw was then six feet, and it made a very palatable hay of good quality. The land was subsequently ploughed for turnips, which grew into a full crop.

Mr Drysdale, Fairfield, Kippen, makes the growth of a winter catch crop of rye a regular part of his farming practice. He sows a plot of winter rye and tares in August or September, sometimes as late as October. The crop is ready in April to cut green for cows. Sometimes three successive cuttings are taken, and then the land is ploughed and another crop sown —either turnips, or tares for autumn cutting. In 1897 barley was sown after the rye was cut, and the crop ripened in quite good time.

Mr R. B. Greig, F.H.A.S., Balcurvie, Fifeshire, now Lecturer on Agricultural Botany and Zoology in the Cheshire Agricultural College, sowed rye in 1897 on oat stubble, which had received a dressing of twelve loads farmyard manure per acre. The rye produced a heavy crop in spring, but it was not early enough to cut for cows for more than a week before the pastures afforded them so much keep that the green rye was no longer required.

Mr R. Shirra Gibb has also tried rye on his high-lying farm as a catch crop after vetches and before turnips, but on his land he did not consider that the crop obtained repaid the cost incurred.

It is apparent, however, from the above examples, that whatever be the limits of elevation at which rye can be profitably grown in this manner, it is a crop which is capable of succeeding perfectly as a winter catch crop on the lower-lying arable lands in Scotland. It stands to be sown so late in autumn that it can be put in the ground after the close of any ordinary harvest, and it is ready to be cut and removed from the fields early enough in the succeeding summer to allow white or yellow turnips, or perhaps even swedes, to be successfully grown after it. Mr Drysdale's practice of following the rye with summer tares is capable of wide imitation. A special merit of rye is that it is hardy enough to stand any of our ordinary winters without damage, and it is also suitable for growing on poor as well as on rich soils. Yet its growth as a catch crop on poor soils cannot be commended unless suitable manures be applied to assist it, as no crop will grow rapidly enough for such a purpose unless it be well fed. But in its adaptability to our soils and climate rye can hardly be said to stand much behind Italian ryegrass.

The difficulties in the way of the extensive growth of rye as a winter catch crop are chiefly those of labour. It is not always practicable to get a large breadth of land ploughed and sown soon after harvest; and in the end of May, after the removal of the rye crop, there is the same difficulty in getting the land cultivated and re-sown without delay with turnips or other crop. No doubt there is a considerable period between the end of May and the time when white or yellow turnips can be no longer successfully sown. But this can hardly be regarded as quite satisfactory. If the swede crop has to be given up in favour of quicker growing but less nutritive turnips, there is a loss incurred which must be set against any benefit accruing from the growth of the catch crop Swedes, however, can be sown safely up to the very end of May, and it is solely, therefore, a question of the provision of enough labour to hurry on the preparation of the turnip land after the rye has been removed. On the amount of working power available or procurable must depend the area of land on which the rye may be cultivated as a catch crop.

There is, however, some difficulty in regard to the utilisation of the crop when grown. It can only be utilised in its green state for forage for a short period between the time when the rye is so far grown as to give a good first cutting till it becomes too hard and fibrous to make a palatable green forage. It is obvious that no large area could be utilised within that brief period in the feeding of cattle in the regular numbers kept on a farm.

In the case of a crop sown in spring for late summer or autumn consumption, an extension of the period during which the crop is fit to be cut for green forage can be readily got by sowing the seed in spring in small successional breadths, with intervals of a week or more between each sowing. But in the case of a crop like rye, sown in autumn for consumption in the spring, this method of extending the period of its suitableness for green feeding is impracticable and ineffective. It must be the chief object in autumn to get as large an area as possible sown immediately after harvest, and with the winter so close at hand successional sowings cannot be attempted. Neither indeed would they prove effective for the purpose. Growth on all the sections would start at about the same time in spring, and the whole area would become ready for cutting at about the same period, and would throw on the hands of farmers an embarrassing superfluity of green food, all in readiness to be used up in some fashion by the ordinary stock of the farm within a briefer time than is possible.

In the neighbourhood of cities in which dairy stocks are kept, this difficulty, however, should not occur. Green rye is such a suitable food for milch cows that it should be readily purchased by dairymen in preference to almost any of the other foods available at that season of the year. Indeed when consideration is given to the common scarcity of green food for cows in the month of May, it seems rather remarkable that a practice of growing rye to supply this want has not already grown up in those districts where dairy stocks abound. No doubt Italian ryegrass partly supplies the need, but there are advantages both to the grower and to the consumer in having both crops available.

It is, however, only in a few localities that a market demand for green rye in spring for dairy stocks could be expected to occur. But the powers of home consumption are capable of great increase on many mixed farms by having the crop eaten in part on the land by sheep. This is a practice little if at all known in Scotland, but extensively followed in the south of England. There the rye sown in September is ready to be consumed by sheep sometimes as early as the month of February, but more commonly in March and April. Ewes and lambs or other sheep are folded on the rye, and are at the same time commonly allowed to have the run of a meadow, or are supplied with a partial ration of roots. There is no apparent reason why this practice should not be followed in certain circumstances in Scotland. It seems peculiarly well fitted for adoption on arable farms where large sheep stocks are kept, or for farms having a small area of arable land attached to a large sheep holding. There is no period of the year when keep is so scarce and so difficult to provide for sheep stocks, either in low land or on hill farms, as in the very months when autumn-sown rye is available. It would be of immense advantage to ewe stocks to be provided with abundant green food during the months of April and May, and it would be of no less advantage to pastures to be cleared wholly or partially of their stocks till the summer grasses had made a good start in growth. In spite of the different climatic conditions, it seems quite possible that Scotland might in this respect, in some districts, borrow at least something with advantage from the practice of the South of England.

Messrs Laing & Mather, Kelso, who have favoured me with some notes on the subject, specially advocate the winter growth of rye for this purpose. As keep for ewes is generally scarce in spring, they consider that the early growth of rye gives it at that time a very special value to flock-masters. It affords the earliest green forage available, and like Italian ryegrass it grows freely again when grazed, and continues to yield keep so long as it is considered desirable to let the ewes remain on it. It is pointed out by Messrs Laing & Mather that it is of importance that the grazing by sheep should begin while the rye is still quite young, and before it becomes too strong and rough. This fortunately favours the early turning of the sheep on to the rye fields in spring. The rye can be used for any class of sheep, but it is regarded as a forage specially favourable to the production of milk, and therefore particularly suitable for ewes and lambs.

Where neither cattle nor sheep are found capable of consuming the whole of the rye sown in the autumn within the limited time available in spring, there remains the possibility of cutting the crop down and making it into hay. This presents no difficulty, for rye can be very easily dried into good hay if it be cut just when it has finished flowering and commenced the formation of its seed; but there is a serious objection to this method of utilising the crop, because it occupies too much time and labour. Even in good weather the crop could not be removed from the field without a delay that would leave no time for tillage to prepare for the summer's crop, and should the weather prove changeable or wet, the delay might altogether destroy the possibility of sowing another crop. For these reasons the conversion of the surplus rye into hay can only be regarded as a possible resource for a limited area under specially favourable circumstances.

Ensilage and Catch-Cropping.

There remains still another method of getting the green forage quickly removed from the field, and that is the method of ensilage. This is a practice that has taken less hold on

British agriculture than its merits deserve. Under special conditions, that occur not infrequently in the course of farming experience, the practice of ensiling crops might with great advantage be adopted much more largely than it is. The construction of a silo presents no obstacle. It is easy to make one, and it need not cost much to convert some unused section of the farm buildings into a silo quite good enough for all practical purposes. When a silo is available the green rye can be left to grow on the field till it has attained its maximum yield, or till the time has come when the field must be cleared, and it can then be quickly cut by the reaper and removed to the silo. The one serious objection to this practice is the amount of carting required to convey the bulky and heavy green crop from the field to the silo, and the one condition essential to this method is, therefore, that the crop be grown near the farm-steading. A distance sufficient to prolong unduly the labour, and consequently the cost of cartage, would in the special circumstances form an insuperable objection to the adoption of this plan of disposal.

The advantages of this method are that the crop at the point of its maximum yield can be quickly removed from the field, and no delay is incurred in the immediate preparation of the land for the next crop. A large quantity of fodder is provided, which can be used either during the summer or the following winter, and this provision would allow the turnip acreage to be considerably reduced, or would enable the farm to carry a larger head of stock.

Sowing Rye.

In the growth of rye as a catch crop it has been found to do successfully in low-lying lands in Scotland when sown as late as the middle of October. But it is obviously better, when the date of harvest admits, that it should be sown in September, or even in the latter part of August. The better the plant gets rooted before winter sets in, the more quickly does it shoot up in spring, and the greater is its yield. The land must be ploughed after harvest, and the seed then sown and harrowed in. The quantity of seed had better be large, and not less than four or five bushels per imperial acre. It is difficult to get rye to grow thick enough, and hardly possible to get it too thick. Indeed it is better, both for the purpose of thickening the crop and of improving the quality of the feed, to sow with it some winter tares. If the land be not in good condition, superphosphate and kainit should be applied with the seed, especially to encourage the growth of the tares. Early in spring a top-dressing of nitrate of soda should be applied alike on the rich and on the poor land, not perhaps so much for the purpose of increasing the yield as to hasten on the growth. In the growth of catch crops the relation between liberal manuring and rapid growth has been surprisingly overlooked, considering that rapidity of growth is absolutely essential to success.

Barley.

In the south of England winter barley is one of the crops that holds an established position in catch-cropping rotations. When sown in autumn it is ready for use in spring, somewhat later than rye. This comparative lateness precludes its use in the same manner in Scotland. On the Ayrshire coast, after early potatoes are raised, ordinary summer barley is frequently sown. On the highly manured potato land the barley grows very quickly, and when the potatoes have been removed from the ground early, and the weather is favourable, the crop attains to a full size in the autumn and gives a very large yield of forage. Occasionally the barley becomes ripe before winter, when it is harvested in the ordinary fashion. It gives then an average produce of straw, with a fair yield of grain of light weight per bushel and low market value, but perfectly suitable for feeding purposes, either as grain or as meal.

Most commonly the crop is unable to ripen completely, and is cut down when it has attained its full forage growth, just when the seed has begun to form. It is cut by the reaper while still green, and is tied in sheaves and set up in stooks in the field in the same manner as a ripe crop in harvest. Should the weather subsequently be dry and windy the straw soon dries in the stooks, and the sheaves become quite fit to be put up in stacks. Should the autumn prove wet, however, the crop is left standing in the fields, and is removed in cart-loads just as it can be consumed by stock. In the stooks it can stand any kind of weather for many weeks without suffering any great deterioration in food value. It provides a succulent and nutritive fodder, which may be used instead of roots right through the autumn and well into winter.

On early potato farms, where a large head of cattle is kept, it is doubtful if any catch crop grown yields a larger or a more useful return than barley treated in this fashion; and apart from its nutritive value, it is especially useful because it forms a substitute alike for roots and for straw. It could also be readily preserved for a longer period of usefulness by making it into silage, but it keeps in good condition in stooks in the fields for such a length of time that an extension seems hardly necessary.

Sometimes the barley is sown mixed with Italian ryegrass to thicken the bottom and to provide winter grazing. When the barley is late sown, and intended to be consumed on the ground by sheep, this is a good practice; but with barley intended for cutting and stooking, it is doubtful whether the increased return forms a sufficient recompense for the greater risk and difficulty of preserving the crop when sheaved.

Valuable as the barley crop is as a catch crop in these circumstances, there do not seem to be any grounds for advocating its more extensive use for this purpose. Except after the early potato crop there is no position that could be assigned to it in our rotation in which some other crops do not possess properties that entitle them to a preference.

Other Crops.

In the south of England winter oats are also grown for catch-cropping purposes, but they do not appear to have been tried in Scotland. Of the gramineous crops, Italian ryegrass, rye, and barley are the only three that are useful for catch-cropping in Scotland, and only the first two seem to be suitable for more extensive employment than at present.

Of leguminous forage crops by far the most important in Scotland is the *vetch* or *tare*, but some notice must also be taken of *trefoil* and *trifolium*.

Vetches or Tares.

The summer vetch or tare is grown in all parts of Scotland as a forage crop, as well as for seed. Its cultivation for the latter purpose is confined to the east of Scotland, while in the western counties and in all dairy districts it is grown somewhat extensively as a forage crop to be cut green in the latter part of the summer, for feed to cows at a time when pastures have lost their luxuriance, and when a supply of succulent food is required to keep up the flow of milk. The vetches are used as a supplement to the diminishing pasture till the winter feeding of dried fodder and of roots has fairly begun. For this purpose the tares are sown in successional sections of a field at intervals in spring and early summer. They are usually sown mixed with some oats or rye, as the stronger stems of the latter crops are needed to prevent the weak-stemmed vetches from falling to the ground and rotting. The combination ensures a good yield in all soils, for if the vetch fail, the oat can always be relied on to give a fair crop.

The vetch, however, is perfectly adapted to the Scottish climate, perhaps more so than any other crop of the Leguminosæ. Like all plants of that botanical order, it has a preference for soils rich in lime, but it does well on a great variety of soils, and thrives especially on those that are inclined to be stiff. Its method of root extension adapts it better to succeed on shallow soils than is the case with some of the other leguminous crops, and it can do very well also in damp imperfectly-drained soils. It is perhaps least adapted for the lighter and drier soils, and on these rye is probably to be preferred, as a rule, for catch-cropping purposes. Its produce is readily eaten by all kinds of stock. In the south of England the vetch is generally grown to be consumed on the land by sheep.

In Scotland it is commonly given to cows or other cattle, but it is also suitable for supplying green food to pigs and to horses. When it cannot be wholly consumed green, it may be made either into silage or hay. It makes a capital dry fodder which is greedily eaten by all kinds of stock. Its great adaptibility as to soil and its suitableness for the climate show it to be a crop capable of a very extended cultivation in Scotland; while the fact that, like the other Papilionaceæ, it is a nitrogen collecting crop and leaves the soil after its growth richer in that substance than it was before, points to it as a crop whose enlarged area of cultivation would add greatly to the cumulative wealth and fertility of our soils.

It is the winter vetch, however, that is grown for catch-cropping purposes, and it deserves special attention on account of the numerous valuable properties possessed by the crop which have just been enumerated. Messrs Laing & Mather, Kelso, say that the winter vetch is hardy, and may be sown any time in September or October, but the earlier the better for early spring feeding. They recommend a liberal seeding of not less than 4 bushels seed per imperial acre, along with a quarter bushel of rye or even wheat or beans, or alternatively 3 bushels tares with 1 bushel Italian ryegrass. They believe that failure of the crop often occurs in the early stages through the ravages of snails and slugs, and they suggest a preventive application of 3 cwt. per acre of common salt a few days before the seed is sown.

Mr Drysdale, Fairfield, Kippen, reports that he sows a plot of rye and vetches every year in August or September, and sometimes as late as October. The crop is ready to cut in April, and is very useful to supplement the food of cows till the pastures become luxuriant. The land is ploughed subsequently in time for turnips or for another crop of tares for autumn feeding, or for barley, which can complete its growth and become ripe in a not unduly late harvest.

Mr Buttar, Corston, Coupar-Angus, sows a small area with winter vetches in the autumn after the lea oats to supply sheep feed in spring, and the vetches are followed by turnips.

Dr James Black, Sheriffston, Elgin, informs me that a similar practice prevails on one farm in high condition in the county of Elgin, but he knows of no other farm in the North on which any catch-cropping is attempted.

Mr James Hope, East Barns, Dunbar, has grown winter tares regularly for many years. He sows them after barley. As soon as the barley crop is removed from the harvest field he ploughs it up, and drills in 2½ bushels tares and ½ bushel rye per acre, mixed. After this has been well harrowed, he sows broadcast 1½ bushel per acre Italian ryegrass. He top-dresses the whole early in spring with about 1½ cwt. per acre of nitrate of soda, and generally begins cutting about the last week of April. The first cutting consists almost entirely of tares and rye. He again top-dresses the crop, from which a cutting has been taken, with another 1½ cwt. per acre of nitrate of soda, and the second cutting consists of tares and ryegrass. He top-dresses for the third time as before, and obtains still another cutting, which is almost entirely composed of ryegrass. There remains afterwards a considerable foggage on which stock can be grazed. In the following year oats are usually sown, and full crops are obtained without any top-dressing.

This practice, in its main features, appears to be well adapted for imitation in other parts of the country. Equally good results are not to be expected in most districts with those that are obtained on one of the best farms in the kingdom, but the vetch and Italian ryegrass are pre-eminently crops that do well on a very wide range of soils, and that can be successfully grown on poor soils as well as on rich. It is to be specially noted, however, that even on the rich soils of East Barns the success of the system is promoted by very liberal treatment, and it is obvious that on poorer soil the results will be still more dependent on judicious as well as liberal applications of manures.

As the vetch crop on East Barns is ready for the first cutting in the month of April, it is apparent that in all other equally early districts the vetch could be followed by other crops as well as by Italian ryegrass. The prominent advantage of the latter crop is that the seed can be sown in the autumn with the vetches, and that no further tillage is required in spring, when time is short and the pressure of labour great. But a crop that can be cut in April, if the supply of labour for tillage be sufficient, can be prepared in good time for crops of turnips, or even barley or potatoes, and the greater richness of the soil in nitrogen may compensate for some little delay in sowing.

Land left bare during the whole autumn and winter suffers from a loss of nitrates, which reduces the yield of the summer's crop; while land occupied by a vetch crop during the autumn and winter not only escapes this loss, but is enriched by the nitrogen collected through the agency of the bacteria in the nodules on the vetch roots, and stored up in the latter, to be subsequently liberated in their decay to nourish succeeding crops.

Trifolium.

Another leguminous forage crop that seems deserving of consideration is the crimson clover (Trifolium incarnatum). This clover is distinguished among the others by its striking and handsome appearance, and by a habit of growth which unfits it for forming any part of a pasture mixture. Its cultivation is at present confined almost exclusively to the southern counties of England, where it is grown as a forage and catch crop. It is usually sown in autumn after a corn crop, and is consumed on the land by sheep in spring in time to allow turnips to follow. It requires to be sown as early as possible in the autumn, in August preferably, or the early part of September, and this necessity seems to throw a serious difficulty in the way of its successful cultivation in Scotland in the same manner and in the same part of the rotation. No delay, however, need be incurred in sowing it after harvest, as little or no tillage requires to be done to prepare the ground for the seed.

In this respect the cultivation of trifolium is easier than that of almost any other crop. It does best on firm land, and a tillage that loosens the soil is not only useless, but is even injurious to it. Hence all the tillage required is a double cross harrowing of the stubble with heavy harrows, after which the seed may be sown. It should then be harrowed again to cover, and well rolled with a heavy roller, and it requires no further attention till the crop is ready for consumption.

The trifolium is not a plant fitted to succeed on all soils. It does best on rich loams or clay loams in warm and sheltered places, and does not succeed on very light or poor soils, or in exposed situations. There would appear, therefore, to be only a limited field for it in Scotland, but it has been tried in a few cases.

Mr Matthew Wallace, Terreglestown, Dumfries, sowed it for two years in the month of August after early potatoes, and got good brairds in both cases, and a fair yield of autumn foggage. The plants, however, nearly all died out before spring, and though one of the winters was unusually mild, there were only a few plants left living in April, which, however, were strong and healthy.

Mr Walter Ovens, Torr, Auchencairn, also sowed trifolium one year in the month of August on oat stubble. It grew into a fair crop, and ewes and lambs put on it in the autumn were observed to do remarkably well. Mr Ovens thinks, however, that trifolium will never become a popular crop in Scotland, as the oat crop is seldom cleared off the land soon enough to allow it to be sown at the proper time. This seems probable, nevertheless the fact that it can be successfully sown after an early harvest adds something to the resources and the possibilities of catch-cropping.

The Cruciferous Crops.

The crops of the botanical order Cruciferæ that are grown as catch crops in Scotland are the *cabbage, kale, turnip, mustard,* and *rape.* All of these are cultivated as catch crops in the autumn in the districts of Ayrshire and the Lothians where early potatoes are grown, and, with the single exception of mustard, they are not cultivated as catch crops in any other part of the country, nor in any other position in our rotations. Their successful growth as catch crops after potatoes is dependent chiefly on the period in the summer in which they are sown, on the condition of the land, and on the manurial treatment accorded to them.

The largest returns can be got for cabbage grown in this way when the crop can be sold in a city market, but in districts where it has to be consumed on the farm cabbage is not a favourite catch crop. It is much more extensively grown after potatoes in the Lothians for the Edinburgh market than in the southern parts of Ayrshire, which are remote from any good market for such produce. The method of cultivation is well known, but one or two special points may be noted.

The land after early potatoes is assumed to be rich in the unexhausted residue of the manures applied in the previous winter, and as no time needs to be lost in getting in the cabbages no further applications of heavy manures are to be recommended. But top-dressings of nitrate of soda should be applied from the time of planting, and should be repeated from time to time as long as the autumn continues mild enough to allow free growth to go on. In the planting of cabbages in late summer it is important to place the plants much closer than in spring planting, as they can never attain to the same size. The cabbages may all be removed, or consumed by sheep on the land, before the end of April, in time to allow another crop to follow in the summer.

The common *kale* is cultivated in the same manner and at the same place in the rotation of crops. It grows more easily and freely than cabbage, and requires a less liberal manuring. It is not capable of producing the same weight of produce, and it is never grown for consumption on the farm, but solely for sale into town. Sometimes it gives a highly remunerative return.

Turnips are also grown to some extent after early potatoes, in preference to either of the other crops. Small round quick-growing varieties of turnips, such as the Golden Stone or Golden Ball, are the most suitable for this purpose. They should be sown as soon as possible after the potatoes have been removed from the field, and to quicken their growth a slight dressing of about 3 cwt. per acre of superphosphate should be sown before the seed is drilled in. In order that a maximum amount of produce may be got, the turnips should be as closely drilled and as closely thinned as possible. The bulbs can hardly become large, and it is essential to have them in sufficient numbers to make a good total yield per acre. The crop may be sold into town, or may be consumed on the ground by sheep. The bulbs are usually too small to be given to cattle, unless sliced or pulped, as otherwise they produce frequent cases of choking. As sheep food, however, they have the great advantage of being very insusceptible to the action of frost. The vigorous growing roots offer such an effective resistance to frost that, in the comparatively mild districts where early potatoes are grown, they can be depended on, as a rule, if required, to keep perfectly fresh and sound till spring—when they form a very useful sheep food.

It seems fairly open to question whether in the case of late-sown turnips intended for sheep-feeding a larger crop would not be got by broadcasting instead of drilling the seed. The practice of broadcasting seems to have fallen entirely into desuetude, but it was at one time the customary method, and it has, in these circumstances, the advantages of saving time, labour, and expense, while a more complete covering of the ground is at the same time obtained.

All the tillage needed after the potatoes have been removed is a thorough harrowing of the surface soil, after which 3 cwt. superphosphate per acre should be applied, to be followed by the turnip seed, which should be sown broadcast at the rate of 2 lb. per acre. The seed should be covered by a light harrowing, and after that the crop requires no further attention till it is ready for consumption.

Mustard.

Mustard, unlike the [illegible] cruciferous crops already considered, is grown exclusiv[illegible] a catch crop. Its special merit for this purpose is that it grows with exceptional rapidity, and produces a large bulk of green forage in a shorter period than any other crop. It is occasionally grown after early potatoes, but it is not a favourite crop for the purpose, as its leaves are easily cut down by frost, and its stems rapidly become so hard and woody as to be quite uneatable. Neither is it found to be a very fattening sheep food. All sorts of sheep eat it freely enough, but they do not readily increase in weight on it, unless some cake or corn be given as well. It affords a better diet when sown in mixture with barley and rape.

It is, however, a very useful crop for ploughing in as green manure. It is frequently grown for this purpose after potatoes on farms where the supply of farmyard manure is inadequate.

The cultivation is simple. After the potatoes have been raised and removed from the field, the mustard seed is sown broadcast on the surface at the rate of about 20 lb. per acre, and is at once covered by harrowing. If a little superphosphate be sown broadcast and harrowed in at the same time it will greatly promote the growth of the crop. In six weeks or so, according to the condition of the land and the nature of the season, the mustard will have grown to a height of 3 feet, and will form a bulky crop. For sheep-feeding it is better to commence folding somewhat early, before the stems become too hard, but for green-manuring the crop is allowed to attain to its full growth. It is then rolled down flat on the soil and ploughed in as soon as possible. This green-manuring is very useful on all soils, but more especially, perhaps, on dry sandy soils, to which the addition of a large quantity of organic matter is of great value.

The rapid growth of mustard has suggested it as a crop suitable for sowing on stubble after the ordinary oat harvest. The Messrs Wright, Downan, Ballantrae, tried this practice one year, but were of opinion that the amount of crop obtained did not pay the cost of the seed. Dr David Wilson of Carbeth, Killearn, gave it a trial after tares cut for hay, but he also considered the result unprofitable.

There seems, therefore, to be no ground for recommending its more extensive employment in this manner.

Rape.

Rape may perhaps be described as the favourite catch crop in the early potato districts of Ayrshire. It is suited for all sorts of soils, from peats to clays, but is also capable of yielding a large amount of produce on light lands, if they be in good condition. It grows rapidly, though somewhat less quickly than mustard, and is capable of continuing its growth through weather of considerable severity. Its special value lies perhaps in its superior nutritive quality. There is no kind of green food on which sheep thrive so well as on rape. As a means of finishing them for the butcher with certainty and completeness no other feeding can rival it. Sheep on mustard can be fattened with difficulty even with the addition of cake and corn, but on rape it is found that no supplementary food is advantageous. The amount of keep it can afford in a favourable autumn after early potatoes, on good land in high condition, is very considerable.

Mr John M. Hannah, Mains, Girvan, reports that in a recent season rape after early potatoes was consumed by lambs between 25th October and 25th December, and gave a return of 28s. per acre, calculating the value of the lambs' keep at 4d. per head per week. The seed cost 3s. per acre, and the labour costs were trifling. This result was obtained in a favourable autumn on rich and highly manured land, but without any special manuring of the rape itself.

One advantage of the rape is the slight cost of sowing it. No tillage at all is needed. When the potatoes are being dug a man should be sent each morning to broadcast the rape seed over the section of the field to be dug up in the forenoon. The seed may be broadcasted at the rate of about 10 lb. per acre on the top of the potato haulms, and when the potatoes are dug up the rape seed is covered. No subsequent harrowing is necessary. It is essential in this practice that the seed should in no case be sown for many hours before it is covered. Should seed be sown in the morning and left exposed to the sun till the afternoon before the potatoes are dug up, much of it will never germinate, and there will be a bad braird.

The great drawback to the growth of rape after early potatoes lies in its liability to suffer from finger-and-toe. The disease attacks it with virulence, and the rape seems to offer a very feeble resistance and is easily destroyed. For this reason it is impossible to grow it often, successfully, on the same land. A means of lessening this risk that is frequently adopted, is to sow only 4 lb. rape seed per acre along with a bushel of Italian ryegrass. Should both do well there is a capital mixed feed, and should the rape be destroyed there remains the ryegrass.

It is not common to manure rape any more than any other catch crop. But there can be no doubt that its growth would be hastened, and its yield greatly increased, by applying 2 cwt. superphosphate per acre with the seed, and by top-dressing with 1 cwt. nitrate of soda after the young plants had begun to braird. The rape is a deep-rooting plant, and is specially adapted therefore to utilise dressings of nitrate.

Conclusions.

A consideration of the whole circumstances and possibilities of catch-cropping in Scotland, as these are determined by our soils, climate, ordinary cropping practices, and the characteristics of the crops available, seems to point to the following conclusions:—

1. That on most of the moderately low-lying arable land of Scotland there is room for a considerable extension of the practice of catch-cropping.

2. That if due value be placed not only on the food produced by the catch crops, but on their influence in maintaining the condition and adding to the fertility of the soil, and to the other indirect advantages resulting from their growth, it would appear that their more general cultivation would add materially to the resources and the ultimate profits of arable agriculture.

3. That success in the attempt to grow catch crops, especially on land of secondary quality or in ordinary condition, is largely dependent on the application to them of quick-acting manures suitable for hastening on the growth of the crops to which they are applied.

4. That in some circumstances it might be found advantageous to introduce over limited areas rotations of crops specially adapted to allow an extension of the catch-cropping system.

5. That catch crops can be most usefully and conveniently introduced in our existing rotations after the growth of a corn crop which is to be followed by a root crop.

6. That the crops which appear to be most suitable for more extensive cultivation in Scotland as catch crops in the ordinary rotations are Italian ryegrass, rye, the vetch or tare, and perhaps some of the clovers.

DAIRY-BUILDINGS.

By Richard Henderson, F.H.A.S., &c., Portland Estates Office, Kilmarnock.

The Dairy-Buildings.

The dairy-buildings are the only parts of a farm-steading that one can with any show of reason dogmatise about. Dairying seems thus far to be the single department of agriculture which is capable of being specialised to any considerable extent. The time will no doubt come when each of the other great branches of farming will be narrowed down to a point that will admit of its being treated somewhat similarly to dairy-work. Under existing circumstances, however, it will be a good while before this can be accomplished. There is so much overlapping and intertwisting of the others that it is difficult in theory to clear up the confusion, let alone trying to do so in practice.

Their Relation to other parts of the Farm-Steading.

It is easy, as it may be profitable, to lay down some sound rules to be observed in the construction of the dairy-buildings of the farm. On the other hand, it is no easy matter to describe within a reasonable space how to proceed in the erection of the steading proper. Although the principles that underlie each group of farm-buildings are identical, yet hardly two sets of buildings are alike. What may be well adapted for the requirements of one district is not for another; and what may come up to the standard of one tenant may be far short of the needs—whether real or fancied—of even his nearest neighbour. But in the case of the dairy-buildings we have a corner of the steading to deal with, regarding the arrangement and construction of which there is less difference of opinion than where other parts are concerned. The pretty widespread uniformity of practice in dairy-work is, as we have inferred, accountable for this. A building suitable for the purposes of a butter-maker in one part of Scotland would serve equally well in any other; and there is even less diversity in Scottish cheese-making than in butter-making.

So long as the buildings are well planned and efficient, the simpler they are constructed the better will they be for all concerned. The days have gone, in the meantime at any rate, in which the erection of farm-buildings were a lighter strain upon the resources of the proprietor than they are at present. What has to be done in this respect nowadays has in consequence to be more carefully considered than it used to be some fifteen or twenty years since. One is seldom afforded a free hand in the matter of arrangement of the buildings. Existing houses have oftener to be dealt with than new ones to be built. It is a simpler business to start afresh and plan the various places in accordance with the latest teachings of scientists, and with a view to economy of labour, than having to adapt old places to similar ends. But the estate manager who is master of his work is prepared to take matters as they come, and he likes an occasional opportunity of showing how he can turn his skill to account in the way of making the most of old buildings.

The Choice of Building Materials—for Walls.

The careful manager makes use of the materials that he finds readiest to hand. He does not, for instance, if he happen to be settled in a stone-yielding district, send to a distance for bricks; nor, on the other hand, does he, if his charge lie in a clay country, bring in stone to build with. There are, of course, occasions when it is economy to use bricks where stone is plentiful and the cheaper of the two. The space available may be limited, and a brick wall takes up less room than a stone one does. And brick partitions, in nearly every case where they are conjoined with stone walls, afford a saving.

Materials for Roofs.

There is less selection offered in the roofing materials. Slates are equally available in almost all districts, and so is either Continental or American timber. Estate-grown wood is sometimes to be had, but not often. There is plenty of native timber scattered throughout the country fit for building purposes; but there are few estates on which it can be converted into usable material. And even where the necessary appliances exist for doing so, it is seldom one sees the display of sufficient forethought to provide for the proper seasoning of the timber. And it is great waste to use unseasoned timber, even in farm-buildings, when foreign-grown can be had so readily and so cheap, comparatively speaking.

Floors.

The locality seems to have more to do with the nature of the floors of the average farm-steading than with either the walls or the roofs of the same. In a brickmaking district we find the floors laid with brick, or partly brick and partly clay; while in a stony one either flat stones or small boulders, accordingly as one or the other is the more plentiful, are the serviceable medium. Portland cement concrete, which is cheap and a handy substance to manipulate, is nowadays coming rapidly into favour as a floor-forming material wherever wood is not practicable for the purpose. The cement is at once easy to be obtained and very portable. And in few localities are the other elements or components of concrete difficult to be got. A concrete floor is the best kind of all for the dairy-buildings, with the exception, it may be, of the cheese-ripening room; but of this more anon.

The Byre the Central Point of the Dairy-Buildings.

The byre or cowhouse is the central point round which the other dairy-buildings converge. The aim of the careful manager is so to arrange the two sets—the dung-stead, pig-house, and cooking-shed at one end, and the scullery, milk-room, and other dairy places at the opposite end—that they will hold the same relation to each other that he hopes exists between himself and his dear departed—be near, yet far apart,—near enough for convenience in working, and yet so well separated as to leave the easily-tainted milk or cream free from the risks of contamination by means of the usually impure air of the byre, while it slowly undergoes the process of ripening in the milk-house.

The Position of the Byre with regard to the Farm-Steading.

The position of the byre in a well-planned steading is thus made subservient to that of the straw-barn on one hand and of the dung-stead on the other. The bulk of the straw brought to the steading has to be carried by hand into the byre, therefore it is evident that the nearer the two are placed together the greater will be the saving in this item of labour, which is by no means a small one. Since the itinerant corn-thresher has come so prominently into play, more especially at the smallish farms that are so characteristic of the dairying districts of Scotland, the straw-barn has become a less important feature of the farm-buildings. When the hired mill is regularly had recourse to in preference to the home one, it then becomes the farmer's turn to arrange on his own account the relative position of the straw-store to the byres, for it must be housed or ricked somewhere if economy is kept in view. The lightening of the heavy as well as unpleasant labour of removing the soiled litter and solid excreta of the cows is another point well worth paying attention to. The nearer, therefore, that the dung-stead can be placed with regard to the byre, the less will be the labour needed to keep the latter place clean.

Points to be considered in the Arrangement of the Byre.

In discussing the dimensions and manner of construction of the byre, we would have it borne in mind that we have in view, as already hinted, the wants of the average kind of farmer. Something both plain and substantial, capable of being economically worked, wherein his animals may be comfortable as well as healthy, is what suits him best. Something that will stand good for a while without constant repairing he is naturally well pleased with.

The Comfort of the Animals.

But the animals also require a little consideration. The owner of the animals has the control of their health in his own hands; but the man who sees to the erection of the house can do something towards their comfort. The animals must have a tedious time of it in their long imprisonment from November until May. For about seven months out of the annual twelve they are tied up in their stalls day and night. In good weather they get a run out while being watered, but these breaks are irregular, and cannot count for much against the total time of enforced confinement. Nearly all through the dreary months of winter they who roam at will during summer and autumn in the pasture fields—free to whisk off flies and to take up any position they choose as they stretch themselves at ease, able to lick and scratch themselves as best they can, and at liberty to gallop to the nearest shade when the ominous hum of the bot-fly is heard in the air—have to content themselves with 7 feet by 3 of standing and sleeping room. Neither to cows nor men is summer ever all sunshine; but one would think that it must be a cheerless day indeed in grass-time which is not preferable to a winter day in the byre. Chained by the neck, she then cannot even lick herself except in a few places. Unlike the fattening bullocks who are encouraged to eat their fill and thereafter to rest and sleep, the cows have not very often more than is reckoned necessary to keep them "aboot the bit." Not that we wish to infer that they are ever starved; but they never at any time receive such abundance of food as induces the drowsiness which is said to follow on the practices of the glutton. About as much, however, as the deviser of the byre can do towards the comfort of its inmates is to render their lairs as comfortable as possible. It is hard lines on the animals when, in addition to their general discomfort, they are subjected to the grievous one of an uncomfortable bed. Many a poor cow has to content herself with an irregularly-paved stance for winter quarters.

No Litter is available to the Scottish Dairy-Cow.

This is bad enough to stand upon; but it must be infinitely more trying as a sleeping-place. And all the more too, be it remembered, from the fact that no litter can be spared for the benefit of the animals. We are writing of matters as they exist in the south-west of Scotland. Things may be different in the other dairying districts of Britain, but at nearly every farm throughout the Scottish one where our experience has been gained, matters are as we seek to describe. The Ayrshire cow is indeed a lightish animal, and suffers less inconvenience from the absence of a layer of straw between her body and the floor than a cow of a heavier breed would do. Were it to spare, however, the Scottish dairy-cow would not be denied this comfort. But the typical dairy-farmer of Scotland crops as little as he can, and in consequence straw is never superabundant with him. What he raises he uses as fodder.

It must not be understood that there is never any straw among the animals' feet. There is, of course, always some waste either of hay or straw going on. The animals usually toss about or turn over their fodder before they settle down to consume it. They wish to see if it is any better at the bottom than at the top, and during the process a good deal of it is lost so far as eating it is concerned. They, like children, believe in eating the best first, and by the time they are ready to deal with the inferior or less attractive stuff, much of it has got under foot and been worked back beyond the sweep of their prehensile tongues. Occasionally, too, any damp or musty fodder that may be considered unfit for food is thinly scattered over the lairs. But it may be taken for granted that at the great majority of Scottish dairy-farms, straw cannot be spared for the purpose of littering the cows. When this is so, the need for providing a smooth bed for the cow comes more home to one's mind.

It may be that we are making the most of the cow's discomfort, and that much of what we are assuming is mere fancy. At any rate there can be no denying that an animal is bound to lie more comfortable on a smooth floor than on an irregular one. It requires very little argument to prove that comfort there can be none when an animal cannot lie without the corner of a paving-stone sticking against her ribs. This may be considered an extreme case by many. It is gradually becoming so, no doubt. All the same, many instances of the kind we refer to can still without difficulty be pointed out. Abortion and allied evils, if not often directly traceable to such means, must at any rate sometimes find in them very potent predisposing causes.

The Room allowed to each of the Animals.

The cows, as we have already hinted, have not much elbow-room allowed them in the byre. Three feet is the nominal breadth of bed set apart for each animal, or perhaps the better way to put it is to say that 6 feet is allowed to each pair of them. This is the standard distance between the travises or stall-partitions, measuring from centre to centre of these; and two cows go to each division, so that each cow has barely 3 feet to herself. And even this is considerably reduced by means of the space taken up by the hinder stall-post. The post in question is from 4 to 6 inches in diameter. On this account each cow, excepting the two tied against the end walls, loses from 2 to 3 inches off the breadth of her bed. The standing room is not much affected thereby, but when the animal takes to the floor she is bound to feel the pinch. When one or two lie down there is no crowding. But if the whole row would recline, a good deal of come and go has to be enforced before a permanent settlement can be assured. When all of them want to lie at one time, none can stretch her limbs to their utmost and indulge herself in blowing like a porpoise, as they are fain to do at times. They are obliged to keep on an even keel, as a sailor would say.

From 7 feet to 7 feet 3 inches is the standard length of the bed measured from the face of the wall to edge of the "grip" or "groop," as the gutter is called in the west. With this no fault can be found. It allows the animal freedom to feed, and admits her to pass her excrement directly into the gutter without soiling her bed. Experience has settled this point, and so in like manner has evolved the breadth of cushey cow's bed. Although apparently very limited, had she much more at her disposal she would rarely keep at right angles to the wall. Standing first to one side and then to another, she would mess in other places than the "grip," and there would be no keeping the animals clean. And were she tied any looser, she would inevitably hurt either of her neighbours or be hurt by one or other of them; for the Ayrshire cow has sharp horns, and she knoweth not mercy.

The Old System of Housing the Cows.

Their lot is better, however, than that which fell to the cows of earlier times. It is not so long since it was customary to secure the cows by the head in a sort of pillory affair. Each cow was held by the neck between two upright sticks, one of them hinged at the lower end to let the cow's head in or out. When the cow's head was in place the movable stick was secured at the top with a peg, and the animal was fixed so far as getting backwards or forwards, or even looking over her shoulder, was concerned. She was free enough to move her head vertically from the trough up as high as the cross-piece which secured the upper end of the sticks; but the horizontal range of her head was extremely circumscribed. She had no chance of using her tongue on her coat. Travises there were none to further reduce the breadth of her bed. Nor were any needed, for the packing was close enough to keep each one in her proper place in the row.

The General Type of Scottish Byre.

Fig. 1 gives a section of the arrangement of byre most commonly met with. In this kind of house there is room, it will be observed, for only a single row of cows fastened face to the wall on the left side, the "grip" and passage together taking up what is left of the breadth of the building. The feeding-trough sits on the floor between the wall and the shoulder-post of the travis. The chain by which the cow is secured is attached to this shoulder-post, which is placed about 2 feet from the wall. The chain is given 16 or so inches of vertical play, this end being gained by allowing the link or ring that attaches it to the post to move up and down on a piece of iron rod so fixed to the post that a portion of it stands clear in order to afford the required vertical range of the chain.

The travis, including the hind-post, is usually 4 feet in length from the wall, and stands 4 feet in height. The "grip" is 18 inches wide and about 6 inches deep next to the bed. The bottom of the channel, as shown on the plan, is given a hang towards the passage or walk. This is for the purpose of allowing the urine to get past the solid excrement, which generally falls into the "grip" close to the side nearest to the animals, and away directly to the outlet from the byre. It is customary to keep the walk a little below the level of the bed, so that, notwithstanding the hang outwards or backwards of the bottom of the "grip," its edge next the walk is not so deep as that next to the bed. Some 3 or 4 inches it measures here. The walk itself is given a slight inclination from the wall to the "grip."

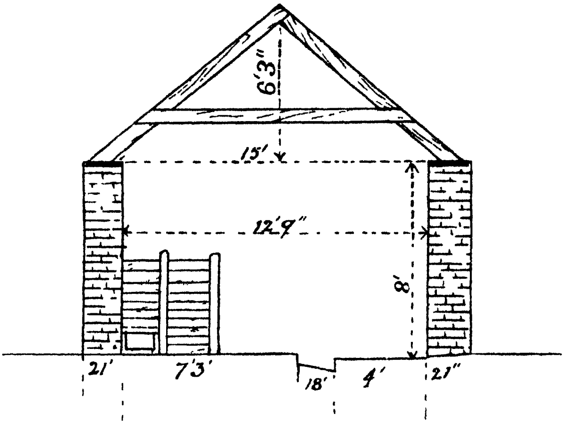

Fig. 1.—*Single byre.*

And the floor of the byre as a whole is likewise given a fall to one end or the other in order to drain off the fluid excrements. It is practicable to give a cowhouse much more fall lengthwise than one which is set apart to hold bullocks permits of. In the latter case the animals maintain an almost constant dribble, and their lairs for half-way up are seldom dry. Were the urine, therefore, free to trickle from one lair to another almost as readily as into the "grip," which would happen if there was much inclination in the byre lengthwise, the beds would be rendered all the more uncomfortable. With the cow, however, the bed is hardly ever wet, on account of the urine which she voids falling almost directly into the channel behind her.

The inclination of the cow-byre is, in fact, very much a matter of circumstances. The less of it, so long as the "grip" drains freely, the better perhaps. Nor, on the other hand, is there any necessity for giving much inclination to the bed from wall to "grip," seeing that there is seldom any wetness to be drained off it. It stands to reason that an animal will both stand and lie more comfortably on a level than on a sloping surface, more especially if it slopes two ways at once—backwards and to one side. Moreover, a cow, which is during a great part of her life badly fitted to stand the strains that are liable to follow upon placing her body in awkward positions, is of all farm animals the worst adapted to put up with any discomforts of the nature referred to.

The Air-space for each Animal accommodated.

Before we go further let us see what air-space a building constructed according to the dimensions given on the section would allow to each of the animals it sheltered. The walls are 8 feet high inside, and they are 12 feet 9 inches apart. From wall-head level to the apex of the roof we may allow 6¼ feet, and take it that the roofing-boards are 15 feet apart at the wall-head. Working out these figures in this way, $12{\cdot}75' \times 8' + 15' \times 3{\cdot}125' = 148{\cdot}875'$ — the sectional area of the building—which multiplied by 3′, or the breadth allowed to each animal, gives us 446·6 cubic feet of air as being at the disposal of each animal. This is short of the measure recommended by the least exacting of our various county councils—that of Ayrshire. In that county 450 is mentioned as a fair size as regards existing byres, but they must not be less than 375. It is gross measurement, however. We have allowed nothing for the space occupied by the troughs and travises, or for the room taken up by the numerous rafters and tie-beams (the couples and the baulks). We venture to say, however, that more cows of the Ayrshire breed have less air-space than what have a larger one than this at command. An additional foot to the height of the walls would bring up the individual air-space to about 484 cubic feet. Another foot put to the breadth, together with the slight proportional heightening of the roof, would all three now bring the total up to about 500 cubic feet of air-space to each of the inmates of the byre. Anything less than this is of course inadvisable where one has to provide a new building.

In fig. 2 we have the most prevalent section of a cowhouse. Here we have two rows of cows, one facing each wall. This arrangement, it can be gathered by the initiated at a glance, saves a walk or passage compared with the description of byre as exemplified in fig. 1. Besides this gain to the proprietor, the arrangement is to the tenant a decided saving of labour. It is easier to feed the animals when one has a double row to deal with than where the same lot is strung out in a single line. The one row means twice the length of walk more than in the double one to be gone over on each occasion of feeding. And the same applies to the cleaning of the house. But in a byre of this section we are sacrificing the air-space.

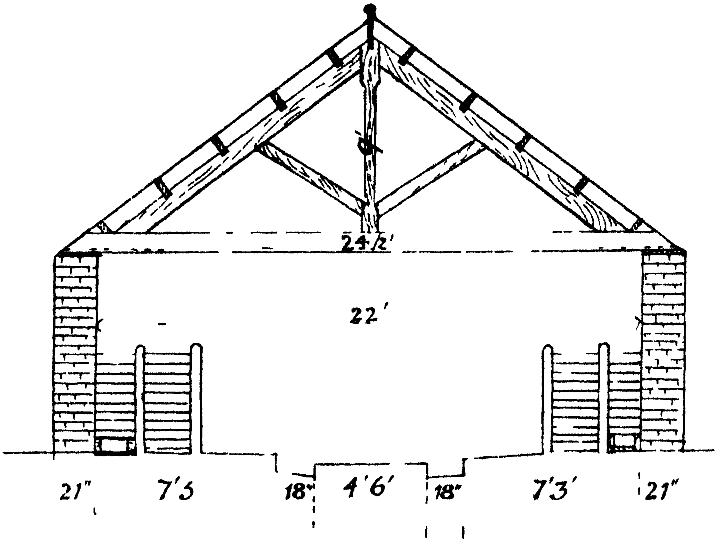

Fig. 2.—*Double byre*

The section in fig. 2, with the walls 8 feet in height, the lairs and "grips" the same as in fig. 1, a walk 4½ feet broad, and the height of roof above the level of wall-heads 9 feet, gives us only 429 cubic feet for each cow. And even after adding a foot to the height of the walls, and other 6 inches to the breadth of the walk, along with the little extra height of roof which might accompany the latter, we get no more than 472·5 cubic feet, and that gross too. Five feet is perhaps little enough for the breadth of a centre passage. We would not care to arrange for less ourselves. Any more, however, brings us in for increased expense of roofing. And 9 feet of side-wall seems to us about the maximum height one is justified in erecting a byre to be open to the roof.

Fig. 3 brings us to another kind of byre. It is the best of the three, but it is the costliest, and therefore seldom met with at the ordinary farm-steading. At the home farm it is not uncommon. It can be attended to at the same outlay of labour as the byre which fig. 2 represents. What the one loses in respect of being handily cleaned, it gains in the readiness with which the animals can be fed. If number 3 requires a longer round to be taken with the manure-barrow, the food-stuffs have a shorter distance to be handed right and left from its centre passage than they have from that of number 2. This description of byre affords a big breathing-space to the animals. Taking the passages at the very narrowest width practicable—that is, 2 feet 9 inches each for the two behind the cattle, and 4½ feet for the centre or feeding passage—gives a byre measuring 27 feet wide inside the walls. This with 8 foot side-walls, and, say, a perpendicular of roof angle of 11½ feet, tots up to 578 cubic feet for each cow. But making the passages respectively 3½ feet and 5 feet increases the breathing-space considerably. This is, in fact, the byre that is most capable of being enlarged internally without sacrifice of workable proportion—without having, for instance, more floor-space than there is need for. It is the type of byre best adapted to suburban or populous places. It possesses another good point well worthy of notice. Animals that are housed in

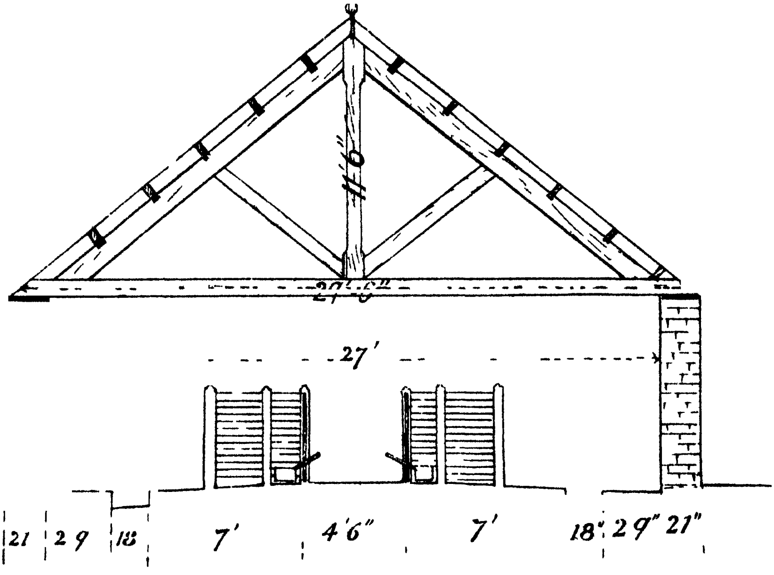

Fig. 3.—Double byre with centre feeding-passage.

it are not enforced to breathe against a wall. The gases they expire get directly away from them at once. The lairs, it will be observed, are shorter in this class of byre, the animals being better able to stand forward than in others where they face a wall.

The reason why the Authorities seek to enforce a certain Air-space for each Animal.

Why do the authorities seek to enforce that every milk-cow that comes under the Public Health Acts shall have a certain amount of breathing-space at her disposal? Because in order to be healthy a cow must have fresh air to make use of. The authorities cannot lay down any statutory method of ventilating buildings; and if they could they would never be sure of their injunctions being generally carried out. All they can do, therefore, is to stipulate that, to begin with, each cow shall have a certain air-space allotted to her wherever she may happen to be tied up. As to the renewal of that air when once breathed they do not interfere. Their action may be interpreted into saying: "Give them a good mouthful to start with; it will serve them longer than a small one; at least it will take longer to become contaminated, after which we can do no more." There is, one would think, more chance of a big room remaining fresher and less stuffy than a smaller one; but it is merely a matter of degree.

This rule-of-thumb sort of reasoning seems, however, to be a very belated one. If the authorities do not see their way to enact rules for ventilation, they might at any rate leave to their inspectors the duty of seeing it attended to. These officials are sufficiently well trained to look to this. And it can be done without making the buildings any larger than there is absolute need for.

Ventilation—the Physical Features of our Atmosphere.

In the circumstance of our living on the outer surface of the earth—at the bottom of a deep sea, as it were, of fluid gases—we may almost be compared to fishes in the water. We, no more than they, can exist without being surrounded by our special fluid. But our enveloping medium is a much more rarefied and quickly acting one than holds the finny tribes. The currents in ours are more easily set agoing and are much more violent than in theirs, because ours is gas and theirs is water. The latter varies but little in volume either under pressure or under the influence of heat; ours, on the other hand, responds in an instant both to heat and pressure. A vast volume of it may be squeezed into the space of a cubic foot, while a like measure of it, when subjected to a violent heat or released from pressure, will expand indefinitely; in every case, however, obeying the fixed laws known to physicists. Wind is but an air current. Air is less stable than water, and on that account is easier put out of equilibrium. It does not take much to disturb the balance. Whenever the pressure bearing upon it becomes unequal commotions begin. Where one part is more relieved than another there the atmosphere expands and becomes attenuated or rarefied. But this area is surrounded by air under greater pressure, and the latter at once seeks relief by flooding into the space which affords room for expansion. Or another portion of air gets heated above the temperature of that around it and much the same thing occurs. Heated air, like heated water, seeks the surface. This action causes more or less of a vacuum, which the air outside of rushes in to fill up. The quicker these initial disturbances take place the stronger are the side currents, or, what is the same thing, the more violent are the resulting winds. Our fickle climate is due to the position of our country in an area where air disturbances of an ever-changing and uncertain nature are constantly going on. We are not free, however, to enter on the fascinating subject of meteorology.

The Chemical Aspect of our Atmosphere.

The air we breathe and move about in is primarily a mixture of the two well-known gases oxygen and nitrogen. The nitrogen serves no other direct purpose, where man and animals are concerned, than to dilute the life-giving oxygen. Outside air, which of course is the standard we seek to attain in inhabitable buildings of all kinds, contains these two gases in the following proportions: 23 parts by weight of oxygen to 77 of nitrogen, or 21 to 79 by volume, keeping them in the same order.

Oxygen.

Oxygen is the great vivifier of nature. It is the cause of all heat, force, and action. It keeps all our parts in motion. All growth as well as decay is due to its action. Were it present in the air in larger proportion than holds good on our globe life would proceed too rapidly for our bodies, constituted as they are. In air wood and coal burn readily, which is equivalent to saying that they are easily oxidised, for combustion is simply the act of combination of oxygen with the different elementary substances of the body being set fire to or consumed. But in pure oxygen iron filings take fire and burn brilliantly, and phosphorus when exposed to it at once gives off an intense light. Were there a little more oxygen in our atmosphere, even the slowest of us would run our career in a much shorter time than it takes at present. Were there less, the quickest among us might become sluggish. But the proportion which the one gas bears to the other in the air which envelops our globe seems never to vary.

The Diffusion or Expansion of Gases.

Gases possess the curious property of thoroughly intermixing with each other when they come into contact. This property is not characteristic of fluids, at least nothing to the extent that gases reveal it. When two or more fluids are brought together and left to their own resources they will, provided no chemical action takes place between them, and that they are not decided solutions of the various salts, assort themselves into strata according to their degree of density, the densest taking the bottom and the lightest the surface, the others falling into their respective places somewhere between the two. It is different, however, with gases. When two or more of these are brought together they at once begin to get hopelessly mixed up. Chemists term this property the diffusion of gases. Were it not for this law of nature we would be obliged to keep moving about in order to get fresh air to breathe. If we remained long at one place we should inevitably pollute the air immediately surrounding us with the exhalations from our lungs and skin. But by the law of the diffusion, or in other words the expansion, of gases this contingency is removed, and, other things being favourable, we could spend our lives in the one place without risk of death from impure air rendered so by the necessities of our bodies. Our exhalations disperse into space the moment we are rid of them, gradually getting more and more diluted until at last they are extended and drawn out to a degree of tenuity far beyond our power to follow up.

Nitrogen.

It may be implied from the foregoing that nitrogen is an exceedingly inert substance, and as it exists in the atmosphere is only of negative benefit to animal life. It is, however, this very inertness that makes nitrogen so suitable as a diluent to the energetic and almost virulent oxygen. Were it not so stand-offish to other bodies it would never answer the purpose of watering down the world's free supply of oxygen to a degree adapted to animal life. Nitrogen, notwithstanding its abundance in nature and its general aloofness, is one of the most essential elements in the life of both plants and animals. Wherever the organs in connection with either are in the highest state of development, there nitrogen, whether as a component of the organ itself or of the complicated substance with which it has to deal, takes up an important position. All the higher organic bodies contain nitrogen. The higher grades of life cannot exist in its absence from the tissues among which they gain a seat. Hence its importance in the economy of our globe as a whole.

It is abundant enough, but not readily available. Some species of plants can avail themselves of nitrogen as it surrounds them in the atmosphere. This they are enabled to do through the agency of bacteria, which establish themselves on their roots. These bacteria are able to assimilate the free nitrogen of air, and can join it to other elements, which compounds are eventually laid hold on by the sap of the plant, and carried by it to the organs that are in need of it. But the plants which are unable to avail themselves of these extraneous aids—and they are the vast majority—although waving in a sea almost entirely composed of nitrogen, cannot feed on it. Ere they can bind it up in their systems it has first to be in combination with other elements. Plants, in short, cannot make use of nitrogen pure and simple. They can only turn it to account when they get it presented to them locked up in some of the nitrates—that is, nitric acid in combination with a base, it may be of soda, potash, or lime. None of the cultivated plants can thrive unless they receive an ample supply of nitrogenous food, neither can man nor any of the animals. Although plentiful enough in nature, farmers have to pay about sixpence a pound for all the nitrogen they use, both in manures and feeding-stuffs.

Other Gases contained in the Atmosphere.

Air contains some other gases besides the two we have been describing. But these are small in quantity compared to the predominant pair, and, unlike these two, they are mostly compound gases. Two or more elements are in their case chemically combined into one. The most important of these is carbon dioxide, or one part of carbon joined to two of oxygen. We do not meet with carbon as a gas when it is isolated or out of union with other bodies. We know it in the three forms of the diamond, blacklead, and charcoal, each of which is solid and tangible enough in all conscience. But in carbon dioxide, or carbonic acid gas, by which name it is more popularly known, we find carbon disguised as a gas.

Carbon dioxide is present in the atmosphere to the seemingly small extent of four volumes of the one to every ten thousand of the other. This is sufficient, however, to provide trees and all other plants with the carbon they require; and taking the vegetable kingdom as a whole, about 50 per cent of the dried substance of the plant is carbon. What carbon the plant needs it obtains from this natural store in the atmosphere. While plants, on the one hand, are extracting it from the air, we are constantly exhaling it from our lungs and skin. We maintain our heat and exert force at the expense of the carbon we consume in either animal or vegetable food-stuffs. It is burned or oxidised in our bodies, and the resulting carbon dioxide is breathed out by us into the atmosphere. The countless household fires and factory furnaces throughout the country are likewise constantly setting free a great volume of it. Thanks, however, to the law of diffusion as it affects gases, the proportion we have quoted varies but little. At thickly populated centres the proportion may at times be considerably higher; but every wind hastens diffusion, and thus helps to maintain the balance. Still there is bound to be at all times more of it in the air of these places than there is out in the open country. Although a mainstay to plant-life, it is by itself a poisonous gas to men and animals. It is the fatal choke-damp of the miner.

Ammonia.

Ammonia, a combination of one part of nitrogen to three of hydrogen, is another gas present in air, only in small quantity, however. Some other gases in which nitrogen plays the leading part are also present. They embrace the different oxides of nitrogen and the acids they form. These, together with ammonia, are liable to be washed out of the air by rain. In this way plant-life receives a by no means inconsiderable amount of nitrogenous food. The plants scattered over unreclaimed land must, in fact, almost entirely depend on this source of supply of available nitrogen. The first-comers, at any rate, must have done so. Later ones would have the stored-up remains of past vegetation to fall back upon in degree more or less according to circumstances. Sir J. B. Lawes calculates that in Britain each acre of soil obtains on on average about 15 lb. of nitrogen in the yearly rainfall.

The Vapour of Water.

The vapour of water—that is, water in a gaseous form—is the only other gas which may be ranked as a constituent of the atmosphere. This one, unlike the others mentioned, is not at all regular in quantity. It is constantly varying in amount. Wherever water is exposed to the air, more or less of it, according to circumstances, goes off into the atmosphere as vapour. There is, however, a limit to the air's absorptive power over water.

This limit, or the point of saturation, as it is termed, varies with the temperature of the air, rising and falling in accordance therewith. When warm moist air meets with a cold current, and in consequence is deprived of much of its heat, it cannot then hold so much moisture and is obliged to part with some of it. If both are pretty well saturated at the time of meeting, the superfluous moisture must fall to the ground. Neither may be near the point of saturation, and the balance may be adjusted without any moisture becoming condensed, and so reaching the earth. There are, of course, many other conditions under which large volumes of air may either be suddenly or slowly deprived of a part of their heat, and thus bring about the phenomena hinted at. In those spells of warm weather which we speak of as being sultry, the air is near the point of saturation. We feel languid and oppressed in weather of that kind. The surrounding air is at those times so laden with watery vapour that we can hardly get rid of the moisture that would evaporate through the pores of our skins. The atmosphere cannot carry it off quickly enough to give relief to our bodies, and our various organs become stagnated. In a dry bracing atmosphere these conditions are reversed, with what general acceptance we need not seek to expatiate upon. In times of a haar or Scotch mist we come as near as at any other time to the point of saturation of the air around us; but we then feel the effects less, because it is cooler and our bodies are not seeking to throw off so much moisture by way of the skin.

These gases, then, together with the few obscure ones already referred to, and the innumerable and invisible dust particles and bacterial germs of all kinds that float about in air, constitute the atmosphere or gaseous sea at the bottom of which we live and move and have our being. The whole art of ventilation consists in keeping the air of our houses and of the buildings where our domestic animals are confined as near as possible the same as we meet with it under the open sky in our fields.

The Air of a badly ventilated Byre.

If one compares the condition of the air within a badly ventilated cowhouse fully occupied by animals with that circulating outside the walls, he can easily grasp the import of what we have been discussing in this connection. No sooner are the cows tied up than the pollution of the air commences. They at once begin to upset the natural balance of its constituents. Every inspiration they make means a using up of some of the oxygen within the building, and a small addition to the carbon dioxide already contained in the place. Watery vapour is exhaled freely from their lungs and dissipated into the space enclosed by the walls and roof. Much of it, too, exudes from the skins of the animals. Emanations of organic matter likewise find their way from skin and lungs. And finally, there are the odours and gases that are constantly rising both from fresh excreta and those beginning to decompose.

Here, then, are many agencies hard at work changing the original character of the air within the cowhouse. The oxygen is gradually being lessened in volume. The proportion of carbon dioxide is steadily being added to; and so is that of the vapour of water. Over and above, offensive matters such as we have indicated are all the time joining the other gaseous bodies. The laws of diffusion ensure the thorough mixing up of the whole of the bodies referred to. But these beneficent laws are in the case in point sadly hampered in their action. They are interfered with by the walls and roof, and so made powerless to act their part as the natural purifiers and regenerators of the atmosphere. Had they free play to assert themselves they would speedily adjust the balance. But the walls and the roof are there to shelter the animals, and they cannot be dispensed with. The animals must be kept dry and warm.

There is therefore no plan, failing the assistance of diffusion, of remedying the evil state of matters but to obtain a current of air through the building, admitting a supply of fresh air at one place and at the point or points of exit trusting to the escape of that already used and rendered impure. Little wonder one is nearly knocked down on first encountering the atmosphere of a cowhouse the ventilation of which is not attended to, which it seldom is. He ceases after that to be surprised at tuberculosis being so rife among our cows. It can hardly be otherwise, considering the conditions under which the majority of them are housed. The temperature inside an ordinary byre is for the greater part of the season above 60°. The air is laden with moisture. Minute particles of organic matter are floating about it in company with dust and bacteria innumerable. The air, moreover, is deficient in oxygen and too full of carbon dioxide. Animals subjected for long to conditions of this nature are sure to grow languid and become susceptible to the attacks of disease germs. Those of tuberculosis are placed in the surroundings most favourable for their propagation.

Added to this, the cows are occasionally run out to water. Should the day be cold and gusty, the cows, with every pore and tissue thoroughly relaxed, are brought under the circumstances best adapted to induce chills among them. A slight irritation of the lungs of any animal gives the bacillus of tuberculosis its most favourable opportunity of gaining a foothold in that organ. And there is always one or more affected animals in every byre doing duty as centres for the spread of this insidious disease. The wonder is not that the disease is such a widespread one, but that it is not much more prevalent than it is. Everything is favourable to its dissemination. There are cows present to give off an abundant supply of the germs of the disease. The air and temperature of the buildings are well adapted to their nature, and the animals are in such a state as to afford a good seed-bed for these invisible pests. The hitherto healthy cows are under the very conditions to render them susceptible to the disease should the spores thereof happen to be about; and unfortunately there is every reason to believe that in very few of our byres is it ever absent.

How Ventilation is usually provided for.

What, then, are the usual provisions for affecting the little ventilation that really does exist at the average kind of farmsteading? They are primitive in the extreme. A few openings in the sides of the building, either in the form of slits placed half-way up the wall or holes of various kinds a little below the level of the wall-heads, and as counterpart other openings of some description or other at the ridge or the apex of the roof. We rarely meet with a byre in Scotland that is not open to the roof. On the smaller farms in the south-west it is, indeed, quite a common occurrence to find the henhouse stowed away on the couple-baulks, and blocking up a part of that space, both to the detriment of our feathered friends and at the risk to limb of the women-folk who have to see after them. And too often thereabouts do we see the sides of the byre shut out from the air on account of its being made a centre of support to sundry lean-to or tae-fa' buildings in the form of boiler-houses, turnip-sheds, hayhouses, and suchlike.

A building of the nature of a cowhouse ought surely to be allowed to stand out alone to sun and wind unhampered by others built up against it. One side utilised in this way is bad enough, but it is worse where both sides are thus encumbered. There is no method provided whereby what ventilation there may happen to be can be adapted to changes of weather. What there is must stand good in fair weather as well as in foul. The arrangement permits of no distinction being made between a windy day and a calm one. Come what may, the openings are a fixed quantity, which becomes too great when a tempest rages and too small when a calm prevails. What average state of weather they are meant to gauge it is needless to inquire after. A wisp of straw is the rough-and-ready method of counteracting the effects of a gale. During the first heavy blow of the season one or more of the holes may be stuffed with straw. There in all probability it will remain.

The attendants who were spurred on by the extra current to go out of their way to reduce that inconvenience to themselves may next day, in the absence of any discomfort on their part, leave matters alone. The same may happen with other holes when the next strong wind from a different quarter makes itself felt inside the building. They in their turn get closed, and in this way, as the season advances, does the ventilation of the house grow less. It needs the influence of a calm, thick, frosty evening on which the air is still and dense to wake up the attendants to the stewing that the poor cows are undergoing. Then there is a rush to clear the openings in order to admit some fresh air into the place. These remain free of obstructions until another stiff breeze blows, when the plugging process is once more adopted. Thus the seesaw business goes on all through the months in which the cows are housed. The various phases of the weather are, it need hardly be said, always considerably in advance of these somewhat meaningless attentions of the caretakers of the animals; neither is it needful, we daresay, to point out that under such very unmethodical treatment the cows are bound to suffer in one way or another, and through them their owner, and further still, the public at large.

We have dwelt long on this point, longer perhaps than some of our critics will think we are justified in doing, but were they themselves brought face to face with the matter as often as we are they would think otherwise. Those of the number who are qualified to judge of such matters will, we are certain, bear us out in what we have said under this head.

With regard to a remedy for this unfavourable state of affairs we shall treat further on. In our endeavour to show forth the harm it is doing we have been led on in advance of other parts of the cowhouse. We must first, however, have our house before we lay down a method for ventilating it.

The Construction of the Byre—the Walls.

To begin with, we have the erection of the walls to deal with. These require, of course, to be substantially founded, and in addition the building stones or the bricks to be well put together with well-wrought lime mortar. Eight feet, measured inside, is a fair height for the side walls. A foot more may in some cases, when the cubic content of the building is otherwise likely to be short per head of the animals it is meant to provide room for, be advisable. Nine feet, however, is about the outside limit we would care to advocate. Close up to the level of the wall-heads 6-inch pipes should be built in with a slight slope outwards to hinder the admission of water, one in the centre of each double-stall space. These are intended to act as fresh-air inlets. The inside of the walls ought to be as smooth as possible; in fact we go the length of advising a thin coat of plaster to be put on when the money can be spared.

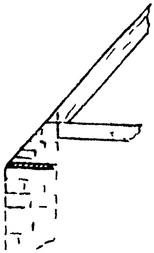

Fig. 4.—*Wall-head beam-filled.*

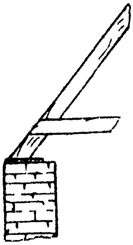

Fig. 5.—*Wall-head not beam-filled.*

The plaster might be of Portland cement for the first 4 feet or so, and ordinary lime plaster higher up. But whether or not the inside wall surface is to be plastered, at any rate let the wall-heads be beam-filled—that is, the angle between the wall-head and the roof, as in fig. 4, be built up, and this space be finished off as a continuation of the wall itself. Fig. 5 shows the wall-head as usually left.

The Roof.

We have a decided preference for the principal or king-post

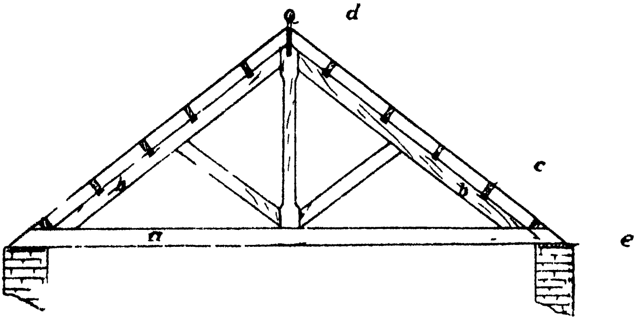

Fig. 6.—*Principal or king-post roof.*

roof over the ordinary Scottish one. Compare figs. 6 and 7 and our reasons will become plain. In fig. 6, that of the principal roof, the pieces of timber that project from one side of the roof to the other across the inside of the byre are far fewer than in fig. 7, which is the common description of roof met with at Scottish farm-steadings. These are commonly known as the baulks or tie-beams. In the first the ties are from 9 to 10 feet apart, measuring from centre to centre of the trusses or principal rafters. In the second example they measure only 18 inches from centre to centre. Any one can understand from this that these ties must serve as a considerable hindrance to the circulation of air within the building. They must also interfere to some extent with the light of the place.

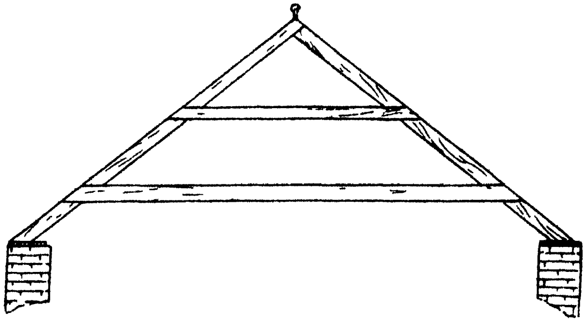

Fig. 7.—*Ordinary Scotch roof.*

Moreover, they are all so many resting-places for dust, and coigns of vantage to cobwebs; the fewer, therefore, of these ties the better for the efficiency of the byre.

We have discussed how essential a free circulation of air throughout the building is to the welfare of the cattle that occupy it. Light, again, is now allowed to be beneficial to the beasts. The sun's rays, either direct or diffused (daylight, in fact), are inimical to bacilli, and we are assured that the warm moist air of the byre makes the building a congenial nursery-ground for these insidious enemies, especially that one which favours the cow—the bacillus tuberculosis. The less dust there is in the place the fewer evil companions there will be for these minute organisms to consort with and get hidden amongst.

Another disadvantage accompanies the close arrangement of rafters. They form a handy store-place in which to stow away odds and ends that the farmer or his wife is loath to destroy, and yet are hardly worth keeping. Disused churns and suchlike frequently find a resting-place there; and it is not at all uncommon to see an old worm-eaten spinning-wheel slowly falling to pieces on the baulks. The worst case of all is, however, the one already referred to, where a "hen-loft" is erected on these, to the detriment both of the cows beneath and of our feathered friends overhead. The belief that such a position is of advantage to the poultry was widely prevalent not so very long ago. It is not altogether dispelled yet, but, thanks to the preaching of sanitarians, it is now pretty well a thing of the past. It is a "gran' place for keeping the hens warm," the unenlightened minority will still declare, "and heat is gude for them." So it is. But noxious heat of the kind that will ascend from the byre can neither be pleasant nor healthy. "What the eye does not see the heart does not grieve," so the poultry have to take things as they come and remain unconscious of harm. It is not uncommon, however, for the whole stock of birds housed in this manner to fall victim to the bacillus tuberculosis already spoken of, derived from the beasts beneath.

Admitting Light through the Roof better than by the Walls.

Admitting light through the roof is in our opinion a better plan than letting it in by windows built in the wall. Windows, to start with, are more expensive than roof-lights. And the sills of windows being convenient places for depositing odds and ends thereon, soon get littered up with rubbish, and become a settling-ground for dust. The glass itself keeps cleaner on the roof than in the side window. Every shower has more or less effect in washing the outer surface of the roof-light. The inner surface, on account of its position, affords but little lodgment for dust, and what does manage to adhere to the glass ere long gets washed off by the moisture which condenses on the latter. The side windows are more rarely washed by rain—never, at any rate, simultaneously as the roof-lights are: and seldom does any other water than what falls from the sky play upon the windows. The inner part of the side window is infinitely worse in this respect than the outer. Dust and cobwebs usually get leave to make the glass semi-opaque. All the side windows cannot at one and the same time get the benefit of exposure to the sun—some of them, in fact, never get it at all. The roof-lights, however, lying almost half horizontal as their position is, catch the sun's smile—some of them directly and others indirectly—all the time it shines forth. Deriving light by way of the roof in this manner keeps every part of the building out of shade. The same can hardly be said of lighting the house by means of side windows. Moreover, the roof-lights, being hinged, are available to help in flushing the house with fresh air at times.

Advantages of the "Principal" Roof over the "Common."

It needs very little argument, one would think, to convince a person who grants that lighting from the roof is preferable to lighting through the side walls, that the fewer obstructions there are in the roof angle to the passage of light the better both for the house and the animals which it shelters. The advantage in this respect goes with the principal roof. And another advantage is on the side of this class of roof. It is much easier on the walls of the building. It exerts an even-down pressure. In the other class of roof there is as much thrust outwards as of downwards pressure. A reference to figs. 6 and 7 will make this plain. It is clearly evident that the truss or framework of the roofing-piece shown in fig. 6 admits of no side pressure on the walls that bear it up. The tie (*a*) holds it too tightly together for that to take place. It is too strong to be stretched appreciably, were there any tendency of the roof to act in that way. But from its manner of construction there is little if any stress sideways. What little there exists is caused by the feet of the side-pieces (*b*) of the truss; but the tie (*a*) takes this strain to itself without passing it to the wall. These trusses or principal rafters are, as we have already seen, placed 9 or 10 feet apart in accordance with how the building divides.

Referring now to fig. 8, it will be seen that cross-pieces stretch from truss to truss along the whole length of the roof. These are the purlins, marked *c* on figs. 6 and 8. They are usually half-checked an inch or two into the principal rafters. Placed in position sloping against these are the roofing or sarking boards, with one end butting against the ridge-board (*d*), and the other bearing on the wall-plate (*e*). They are, however, nailed down to the purlins, and therefore can exert no pressure in an outward direction on the walls. The purlins, which are placed at 20-inch to 24-inch centres, take the weight of these and their

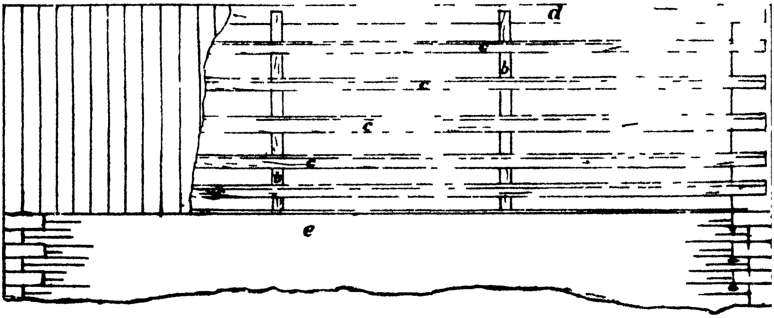

Fig. 8.—*Side elevation of principal roof.*

covering of slates. This they transfer to the principal rafter, which, as we said before, lies as a dead-weight on the wall-head at either end without any tendency to push the two apart. There are, of course, other methods of putting together a roof of this kind, but the one we have described is as simple as any, and quite efficient.

The "Common" Roof.

Compare it now with the ordinary Scottish roof as exemplified in figs. 1 and 9. In the first the truss is made up of the "couples" or rafters and the single "baulk" or tie. So long as the span of the building roofed over is not too great, and provided the "scantlings" or dimensions of the timbers are sufficient to counteract the forces brought into play, there will not be much outward stress exerted on the walls. But the critical point in this respect is often gone beyond. The span may be so wide as to warrant or necessitate an additional tie as in fig. 7.

Fig. 9 may be taken as a well-bound roof. The couples are not so long, neither are they so wide apart at the "feet," but

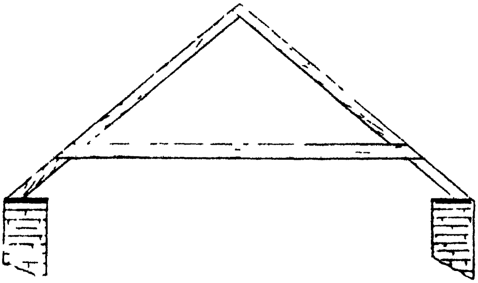

Fig. 9 – *Roof well bound.*

what a single tie will bind the whole rigidly enough to make the strain equal in all parts. In this instance the pressure on the wall-heads will be almost vertical. There will be a little outward thrust from the tendency of the free ends of the couples—the parts between the bottom of the tie and the wall-head—to spread out. The higher, of course, the tie is attached the greater this will be. On fig. 9 the bottom edge of the tie is supposed to be 18 inches above the level of the wall-head.

But, either for the sake of saving timber or of gaining head-room it may be, let the tie, as in fig. 10, be placed higher up, it is easy to see that the tendency on the part of the couple-legs to straddle is increased. Again, as fig. 11 will show, if the sides of the triangle formed by the tie and the couples are too long, they will be unable to sustain their allotted weight without bending or being fractured. To stiffen them to their work an additional tie along the dotted line would be necessary. When the single or the lower of the double ties is placed above the

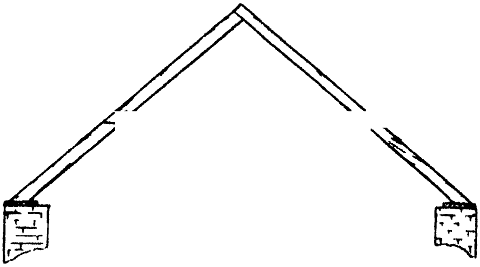

Fig. 10.—*Roof showing "tie" too high up*

limit of safety, either the couple-leg or the wall must give way, or at least adjust itself so as to equalise the strain. We often come across walls pushed over the plumb through this. Not infrequently, indeed, do we find them split, on one end of the

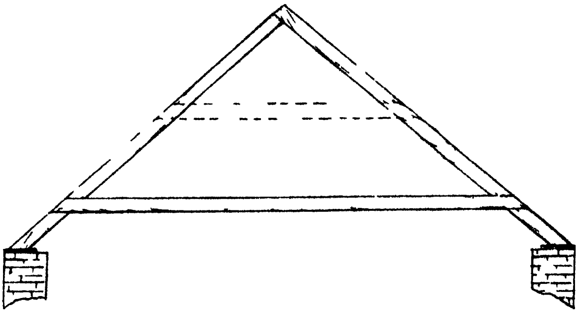

Fig 11.—*Roof requiring an additional "tie."*

house, in two, the outer half having yielded to the thrust of the couple, while the inner half stood plumb. A structure which yields in this way has, it goes without saying, been built without attention to the binding together of the stones.

The subject of strains in roofing is one, however, which affects the interest of the proprietor more than that of the owner of the live stock that are housed in the building. The interest of the latter with regard to a preference between the two classes of roof comes in when the subject is viewed from a sanitary point. Which of the ties interferes least with the circulation of air or the diffusion of gases throughout the place? That one, of course, which offers fewer obstructions to these physical actions,—the one that has fewest pieces stretching across from side to side of the roof. And what hinders the circulation of air also in this case obstructs the passage of rays of light. The principal roof has, we repeat, these obstructions at spaces of 9 or 10 feet apart. The other one has them placed at about 16 inches only. It may therefore be assumed without more ado that the principal roof is the one to be preferred whenever choice is offered. Compare fig. 8 with fig. 12 and our reasoning on this head ought to become clearer.

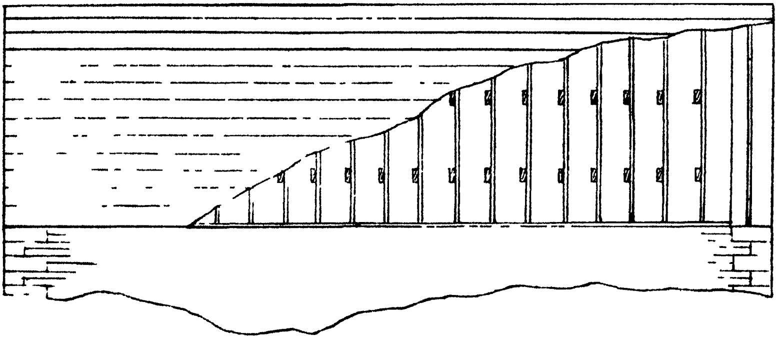

Fig. 12.—*Side elevation of common roof.*

From a sanitary point of view it is a good thing to have the wood surfaces of the roof open to the cowhouse planed, or "cleaned," as the carpenter terms the operation. Dust will lodge less abundantly on a smooth than on a rough surface, and it is easier brushed off the one than the other. In addition to the planing, we would fain have these surfaces varnished; but matters are hardly so far advanced as to warrant the advocacy of having this done. We would, however, in the interest of the proprietor, recommend that all the nails used in the construction of the roof be galvanised. The moist warm air which rises to seek an outlet in the roof is very trying to the constitution of iron that happens to come under its influence. The heads or other exposed parts of nails speedily rust and corrode in such an atmosphere. We have seen the roofing boards slip out of place with slates and all just on this account.

The Floor.

Thus far we have got the walls and the timber-work of the roof of the building disposed of. With the slates we need hardly interfere. We may now turn our attention to the floor of the place. As we remarked at the outset, the material used to form this would, to some extent, depend on the district in which the cowhouse was being erected. Where bricks are cheap there is nothing to be said against their use in paving the beds and passages. It is well, however, to grout the joints either with cement or lime. If simply laid closely together on a layer of sand or ashes, and the joints filled in a rough-and-ready way with either, they are never so satisfactory as when grouted with a thin mixture of cement or lime mortar. When ungrouted there is nothing to hinder the loose material in the joints and that which forms the bed of the bricks from becoming saturated with moisture. Careful grouting prevents this, and also keeps each brick in its place.

Most men who have to do with things of the kind frequently get an object-lesson on this head. They need no reminding how unpleasant it is to step on a loose brick and set the dirty water from beneath it squelching up on bright brown boot or spotless garment. The "grip" we would recommend to be of Portland cement concrete. With this material it can be laid jointless and smooth, which are most essential properties where it comes in. It is the receptacle for the droppings both liquid and solid or semi-solid, and so long as it is water-tight there is not much fear of the soil beneath it becoming water-logged with filth. Better still would it of course be were the whole byre floor beds, "grip," and passage laid entirely with concrete. Flags such as those met with in Caithness, for instance, make an excellent floor. A floor laid with them is as smooth as a brick one, and it has fewer joints. But flags are strangers throughout the dairying district, and may therefore almost be left out of account.

The worst floor of all is perhaps the one laid with small boulder stones—the "kidneys" that come so handy to the Belfast rioter. It can never at any time be either comfortable or healthy. The animal that has to lie on a floor paved with stones of this sort, and without a bed of straw, as the custom is, must at times endure many a discomfort, not to mention numbing aches and acute pains. And there is necessarily so much space between the stones filled with soil alone, if not indeed with filth communicating directly with the subsoil, that the whole area within the walls paved after this manner is bound to have its permeable portions saturated with fæcal matter.

The "Grip."

We have already referred to the formation of the "grip." It will be seen in section in fig. 1, and in the other figures which represent the sections of byres. Next to the cows' lairs it is 6 inches deep; next to the passage behind the cows it measures about 3 or 4. It is 18 inches broad and formed with a dip outwards, as the various figs. show. The slope is not, however, so great as the depth at either side would seem to imply. The discrepancy is on account of the walk being, as a rule, kept a little below the level of the lair or bed. All the hang that is wanted outwards in the bottom of the "grip" is what will run the liquid to that side of the channel. The position of the "grip" is so adjusted to the length of the cow's bed that the solid excrement from the animal falls into the channel just clear of the edge. The urine, on account of the dip outwards of the bottom of the channel, finds its way at once to the outer side, where it is able to get past the solids and away to the outlet beside the door. Here in one important point do we see the advantage of having the "grip" made in one continuous piece from end to end without joint or projection. And with no other material can this be so well done as Portland cement concrete.

We have not mentioned drain, for the reason that we consider its proper place is outside the building.

No Covered Drains inside the Byre.

Sometimes it is necessary to have a drain inside. The byre may be too long to allow of the urine being carried off in one stretch in the "grips." When this is so a drain must be carried up from the lower end to the proper distance in each of the "grips" below the bottom of these; and where it is intended to relieve the channel, it is made to communicate therewith by means of an open grating. It is well, however, where possible, to avoid these sort of contrivances. The better plan is to have nothing but open channels or drains in the place—nothing of this kind but the "grip," in fact. The "grips" should discharge the fluids which they collect through the outer wall in pipes large enough for the purpose, each having a clear and open delivery on to the cover of a gully or cesspool connected with the underground sewer, which is supposed to lead away the stuff which drains from the byre.

Any covered drain within the byre should be similarly dealt with as regards an open outlet. This may be a little more difficult of accomplishment; all the same, it is an essential point in the thorough sanitation of the building. With the effluent matter thus disposed of, we have the house safely cut off from drains, and the house and its contents left to be reckoned with by themselves. Where the relieving drain is absolutely necessary for the efficiency of the "grip," an arrangement for arresting the solider matter is perhaps needed at the inlet; but where water is plentiful, and can be spared to flush the drain regularly, the latter is better rid of any such obstruction.

In a cowhouse having both a smooth and a water-tight channel behind the cows, and with its drainage effected on the lines we have pointed out, there is not much possibility of the air within the place ever becoming contaminated through organic matters being allowed to decompose in sundry nooks and corners. There are no lurking places where matter of this kind can for long lie undisturbed. And where the other parts of the floor are similarly constructed, this great advantage towards the cleanliness and healthiness of the house is all the more enhanced. If but the "grips" and the passages are so dealt with, the place is pretty safe in this respect.

These are the parts of the floor that are most liable to contamination from droppings and other sources. But it is better when the beds are made water-tight in company with "grips" and walks. Then the place can be flushed at will, when water is plentiful and the attendants willing, without fear of rendering the under-stratum of the floor damp and unhealthy.

Tar-macadam as a Flooring Substitute.

It has occasionally crossed our mind that some of the so-called tar-macadam pavements might be practicable for the purpose of flooring cowhouses. If one could guarantee that this material would not have the tendency to cause the cow's hair to stick to it, good and well; but it would never do for the animal to leave part of her coat behind her on the floor every now and again. It would be far before concrete as a medium for providing an easy couch for the cow where straw is withheld for sleeping upon. It is jointless and water-tight like concrete, but it is superior to the other from the fact of its being in addition softer and elastic—properties in the way of comfort which are of no small account where a standing as well as a sleeping place for a big animal is in question.

Something could, no doubt, be done to prevent the cow sticking to the floor when the heat of her body had begun to affect the tarry matter which forms the characteristic base of this flooring material. Were this accomplished a better flooring-stuff for a cow's bed could hardly be desired. And as already manufactured or manipulated, there is nothing to hinder its being turned to account both in bottoming the "grip" and in paving the feeding-passages. It is apt when wet to be a little slippery, but this can be counteracted by finishing it off roughish.

Concrete floors are also very liable to become slippery when wet unless finished rough. With plenty water at hand, how one can slush out to his heart's content, and in a few minutes render absolutely clean, a cowhouse floored without seam or joint as can be done with either material! What a contrast to some of the places we could point out!—places which would be a regular labour of Hercules were they to be cleansed to the same degree, not on account of the amount of stuff to be cleared away, but from the difficulty of getting it out of its innumerable lodging-places in crack and crevice over the whole floor area.

But a tar-macadam floor could not be laid without the supplementary aid of kerb-stones at each side of the "grips." Neither, in fact, can a paved floor of any kind. Concrete is the only material so used that can be made to serve by itself. Beds, channels, and all can be worked out of the continuous sheet of concrete that fills up the area of the floor-space, the edges setting hard enough to maintain themselves as thoroughly as stone can. The stones that are placed at the foot of the bed in a paved floor, and which form one edge of the "grip," are called the "settle" stones. They require, of course, to be big and heavy. The kerb next to the passage does of a lighter nature. Glazed fireclay "grips" are manufactured in some districts. They are made with upstanding edges, one of which answers to the settle-stone and the other to the kerb-stone alongside the passage. These are made in lengths of about 15 or 18 inches. But from the many joints these necessarily cause in the length of the "grip," they on that account alone come far short of concrete for channel forming. Further, these are moulded with a network of indentations on the surface, with the view of affording foothold to the animals. The indentations are traps for dirt, and utterly defy both broom and shovel to render them clean. It is not unusual, indeed, to see concrete floors finished on this bad principle.

Travises.

The lairage of the byre is divided, as we remarked earlier, into 6-foot spaces, one for each pair of cows. The dividing medium, or the travis as it is termed, is either of wood or stone. Stone we never had a preference for. A travis of stone requires to be thick to be strong, which means robbing the cows of sleeping-room. It is generally rough in finish, or at least of a porous texture, and thus liable both to shelter germs or absorb noxious matter. Moreover, a big lump of stone in the form of a travis, when sticking up between two animals, cannot be at all times conducive to their comfort. In cold weather, for instance, these stone travises must rob the animals of heat. They are strong and lasting, however, the only points which we consider are in their favour. Wood makes the best travis. A wood travis is handy, takes up little room, and can be easily repaired or renewed. The usual size of the travis is 4 feet high and 4 feet long, measuring from the face of the wall. The commonest construction is that given in fig. 13, where *a* represents the shoulder-post and *b* the heel-post. Figure 14 represents a better form of travis. In the first the respective posts are carried from floor to roof; in the latter so much of each of the posts as will give stability to the structure is fixed in the ground, the remainder standing only a little higher than the travis-boards. Sometimes, as fig. 15 shows, the heel-post alone is treated in this way, the shoulder-post being carried to the roofing timbers.

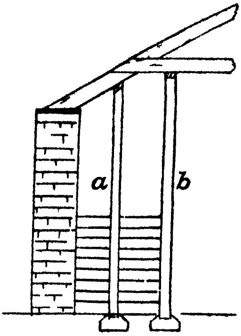

Fig 13 —*Travis*

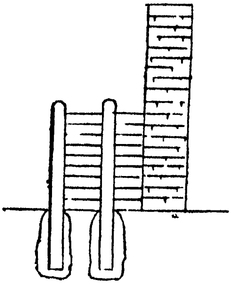

Fig 14 —*A better form of travis.*

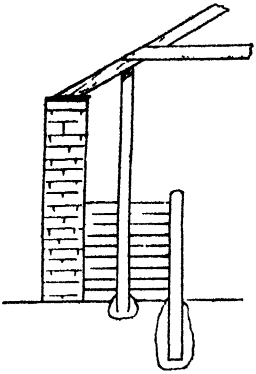

Fig 15 —*A form of travis between the two.*

The arrangement according to fig 13 is the easiest put together of the three. The ground end of the post is either placed a few inches in the ground and paved round about or it is let into a stone, as we see the stall-posts of stables done, and so held in position. The other end is attached either to the roof-ties or collars, if these happen to space in conveniently, or if not, to a runner attached to the roof-ties. This is the prevailing plan. The heel-post is solid, and either round or square—about 5 inches on the face of the latter, and of an equivalent diameter if round—with a groove let in on one side to secure the ends of the travis-boards, as shown on fig. 16. The corners are chamfered off the post if erected square. The shoulder-post is made of two pieces, say, 5 inches by 2 inches, placed close together so as to hold the travis-boards firmly between them, as in fig. 17. The ends of those posts that are sunk deeply in the floor will, unless surrounded by concrete, very speedily decay

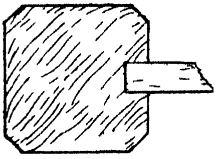

Fig. 16.—*Showing end of travis board*

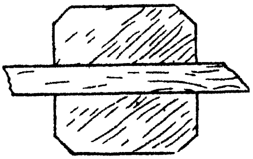

Fig 17 —*Shoulder-post and travis board*

and render the whole construction shaky. This casing of concrete helps, too, to give stability to the post. The posts require to be sunk at least 2½ feet below the floor-level. The fastening chains for tying up the animals are fixed to the shoulder-posts.

The first depicted arrangement of travis, that of fig. 13, is open to the same objection as we advanced against the common system of roofing. It interferes with the circulation of both air and light. A cowhouse divided after the manner of fig. 14 looks so much airier and lighter than one fitted up in the other style, and the animals show to so much better advantage in it that we wonder men of intelligence ever adopt the other. It may cost a little more, but any extra outlay is amply repaid in the improvement of the place otherwise. That of fig. 15 is superior to 13, and ought to be pressed for if 14 cannot be got.

An improved Travis.

We have on several occasions advocated the use of a travis with a single post This occupies the place of the shoulder-post, leaving the beds clear altogether of the hinder one, and therefore affording the cattle a little more room to lie in. Wherever it has been fitted up it gives great satisfaction. The single post is of iron, and the whole arrangement is both neat and strong, and, what is more, is very lasting. It is set forth in

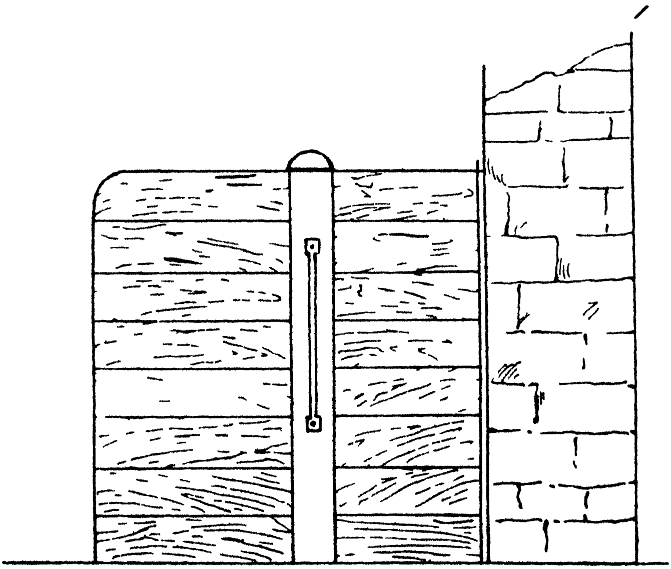

Fig. 18 —*Travis with single post—side elevation.*

figs. 18 and 19. Fig. 18 gives the side elevation, and fig. 19 a horizontal section or plan of the arrangement. The boards slip through the vertical division or slot in the post. The front ends are dovetailed into an iron groove in a plate attached to the wall. This keeps them from slipping back. They are held firmly in position between the two halves of the post when the cap is fastened on, the rigidity of the whole being increased by the tightening-up of the bolts, which are passed through the posts in order to secure the slides up and down which play the tying chains.

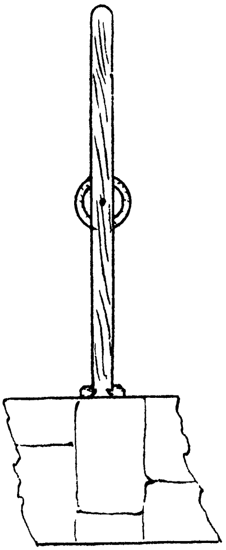
Fig. 19.—*Travis with single post- horizontal section.*

To further stiffen the travis the boards composing it are either tongued and grooved, or dowelled together here and there. The boards are about 1½ inch thick. White pine is quite good enough. As the figures show, there is not much wood used in the concern. The posts will outlast many renewals of the boarding. In fact there is nothing to hinder their holding out as long as the walls. With heavy bases attached to them, and the soil well consolidated round about, the posts stand as firm as rock. And if the precaution has been taken to encase the underground parts in concrete, there is almost no limit to their lasting powers. Dry both above and below, and free of the risk of fracture, the iron will endure for ages.

An occasional coat of paint may be called for, but little else is needed in the way of their upkeep. And their cost is not much to start with. Taken together with a concrete floor, as neat, strong, and effective a byre as the most fastidious person need wish for is the result.

Fodder-racks or Hecks.

Fodder-racks or hecks are seldom fitted up in Scottish cowhouses. The feeding-trough is made the receptacle for all kinds of food, whether it be in the form of stems, roots, grains, or meal. When made of glazed fireclay it answers the purpose admirably. The surface of a trough of this kind is non-absorbent, and therefore never ill-smelling or otherwise tainted. What the cow's tongue leaves behind in the dish is easily brushed out with a wisp of straw, after which the trough is as clean as the day it was placed in the byre. The troughs sit on the floor and to end, two between each pair of travises. They measure about 32 inches long over all, and are about 17 inches broad.

The pair, it will be gathered from this, do not fill up the whole space between the travises. The balance is left in the middle, and this blank is filled up flush with the troughs with stone or brick. It is usual to keep the troughs back from the wall the breadth of a brick. Where this is not done the cows are apt, when in the act of rising, to strike their horns against the wall. The flat part between the edge of the trough and the wall is bevelled off with concrete—at least it ought to be—to prevent anything from lodging there. Stone troughs are still to be seen at many farms. They are not to be compared to those made of fireclay. It is impossible to keep them clean, and at all times they smell offensively. Where they still exist, the farmers would fain replace them with fireclay ones, and every opportunity is taken of doing so.

Ventilation of the Byre.

The cowhouse is now about complete. We have discussed the walls, roof, floor, divisions, and mangers, and pointed out what appears to be the best plan to adopt with regard to each in so far as the comfort and health of the animals, and consequently the profit of their owner, are concerned. But in order to maintain this state of efficiency we must provide for the due ventilation of the place. We must provide the attendants with some easily controllable system of accomplishing that. This want, and another cause connected with heat, which we shall refer to later on, are, we maintain, almost wholly to blame for the disreputable condition of affairs in respect to the ventilation of cowhouses that prevails throughout the country. Some simple system which is adapted to the exigencies of farm-life as known to most of us is all that need be looked for in the meantime. This we can effect out of the wall-head openings previously referred to, and the series of openings of some kind or other that one generally sees at the ridge of the building. The wall-head openings are supposed to admit fresh air, while the others let out that which has been used, or at any rate has become foul.

Ridge Ventilators.

Our preference as regards ridge openings lies towards the double-horned zinc ventilator as represented in fig. 20. This is simple, lasting, and self-reliant, so to speak. It needs no attention, and can hardly get out of repair except it comes to grief through accident or severe stress of weather. Wood affairs that act as ventilators come more readily by harm.

These are seldom kept painted, and in consequence they soon become leaky and rotten. Snow can drift through most of these into the building, and birds can gain an entrance at any time. One likes to see the twittering swallows darting out and in through these openings; but where they are sparrows will likely be too, and we all know what untidy housekeepers these little fellows are. They like well to occupy at nesting-time a ventilator of the kind we are discussing. By the time, however, the pair domiciled there have finished building operations the ventilator is much interfered with as a passage for air.

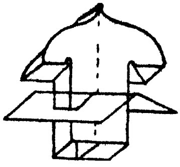
Fig. 20.—*Ridge ventilator.*

Occasionally an open slit is left along both sides of the roof a little below the level of the ridge, the roofing-boards being tilted up a little so as to leave an opening of 1 or 2 inches, and lapped over sufficiently to clear the opening of risk of rain finding a way through the same. But this arrangement also is under the disadvantage of allowing snow and birds to gain entrance to the house. Besides, it is devoid of adaptability to changes of weather. It may serve admirably under certain atmospheric conditions, while in others it may be detrimental to the health of the live stock housed in the place.

With the zinc ventilator and the wall-head opening to deal with, it is quite competent to install a simple system of ventilation that will answer the requirements of the ordinary cowhouse, such as we are dealing with. It is true that the first mentioned at first sight appears to have as little adaptability about it as the others just mentioned. It can keep out snow at any rate, and birds cannot find their way through it. But in addition we can claim for it some degree of adaptability to circumstances.

When it is provided with a diaphragm or dividing piece up the centre of the shaft we have two completely separate openings instead of one. This of itself is an important matter. Heated air might have a difficulty in gaining an exit from the single opening. Where, however, the opposing fluids (the heated current seeking to escape and the colder and denser one striving for admittance) are guided into separate currents confusion is avoided and the exchange of air goes on briskly.

Wall-head Ventilators.

But it is to the wall-head openings that we look for some means of regulating the ventilation of the cowhouse. These should be from 6 to 9 inches in diameter, according to circumstances; and there should be one opening for each pair of animals. In order that we may have control of the admission of air to the building, we must have a way of lessening the area of these inlet pipes. The simpler this can be accomplished the better it is for all concerned, man and beast as well. Fig. 21 shows both an easy and simple way of accomplishing this. As the fig. indicates, the aim in view is obtained by fixing up a piece of wood, one end of it large enough to cover up the opening and the other prolonged into a lever or tail which enables one to regulate with ease the movements of the larger end. The piece of wood is hung on a pin (*a*) fastened in the wall in such a position that the head of it when allowed to rest on the stud (*b*) covers up the inlet completely. A cord long enough to be reached by hand from the ground is attached to the long end at *c*, and by its means the area of the inlet can either be cleared entirely, be reduced in size, or be shut off at will at the cost of a minimum of trouble.

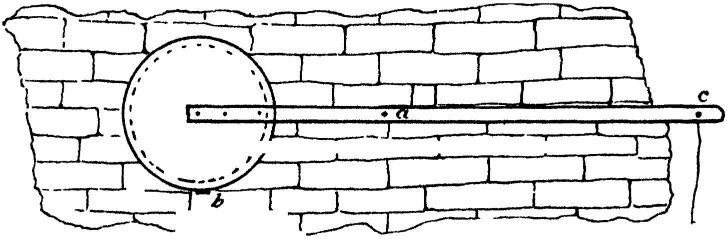

Fig. 21.—*Wall head ventilator.*

This simple and inexpensive arrangement gives the attendant complete control over each opening separately. One or all can be adjusted to suit the nature of the weather at the time. In spells of calm mild weather all can be allowed full capacity for the promotion of currents of air throughout the building. In times of storm and high wind they can be so adjusted as to keep draughts in control. Those on the weather side can be shut entirely, while those on the lee side are open to the full. In fact the attendant can do with them as he or she pleases in the way of adapting the amount of fresh air to be admitted into the house, and at the parts where it is least likely to be prejudicial to the animals. The shafts of the zinc ventilators in the ridge would also be brought under control by means of flaps worked from beneath by cords, but this we consider would be superfluous.

All this about ventilation would seem to enforce our plea for having the byre to stand clear from the hampering influence of other buildings.

Other Methods of Ventilating the Byre.

There are other methods of ventilating the cowhouse, but none, we think, is simpler or better adapted to the tear and wear of ordinary farm usage. Fresh air is sometimes admitted up gratings fixed in the floor of the building; but the difficulty of having these kept clear is enough to deter any "practical" man from recommending their use. Here, for instance, is a system which on the back of that just indicated we promulgated in the 'Farming World Year-Book' of 1895, under the head of "Housing the Ayrshire Cow": "The admission of fresh air from the outside ought, if possible, to be near where the animals breathe. An inlet can be formed between where each pair of animals stands. A 3-inch pipe let through the wall a little above the level of the feeding-troughs serves the purpose. Into the inner mouth of the pipe a zinc or iron box can be fitted, and so constructed as to deflect the entering current and break its force by distributing the inflow right and left along the stall in front of the pair of animals. The air escapes from the bottom side of the box or pipe, but in such a manner as not to constitute a draught. In this way each beast can be provided with pure air in front of it at any rate. The incoming air has not power to play on the bodies of the animals, and in consequence to chill them. It will gently purl from the bottom over the front side of the box without force enough to form a current that would be prejudicial to the animals.

"The principle that underlies the distributor we speak of is simply that of preventing draught. The current through the opening in the wall, necessarily small in area to begin with, being led into a wider channel, loses its force as it expands or widens out. Running water, confined in small space, quickens its current; as the channel broadens, however, the stream slackens speed. When it reaches lake or sea it soon ceases entirely. So with our streams of fresh air. They rush in through the pipes, get their course deflected and their velocity hindered, and, spreading into wider channels, get slowed down, until, as they gently diffuse into the space of the building, they become incapable of overcoming the inertia within. The distributor is simple and inexpensive. It occupies the angle that is formed by the upper edge of the back of the trough and the wall. It is quite out of the way of man and beast. Where the animals face a centre passage the system indicated would, of course, be a little more complicated. A further improvement can be effected in this method of supplying fresh air.

"At the expense of a little trouble and money it can be made self-regulating or automatic. The openings can be made to lessen in bore as the current of air pressing through increases in force. Should a gale of wind play on the outside of the openings, they will almost entirely close. The proposed inlets, it will be observed, are small in area. Fresh air being supplied where most needed, however, admits of the minimum amount being made available. We are able, accordingly, by using this method of ventilation, to keep the animals supplied with fresh air without lowering the temperature of what is already within any more than can be helped. It aids us considerably to overcome the difficulty of aerating the building without making it too cold inside." But methods of ventilation of this description are not at all adapted to the surroundings which we meet with at the ordinary sort of farm.

Maintaining the Temperature of the Byre.

The difficulty that exists in maintaining the temperature of the atmosphere within a cowhouse, in which air is allowed free ingress and egress, is the other cause previously hinted at of blame for the bad state of matters we meet with in this connection, taking the country at large. Cows, when in milk, in order that they may do their best as milk-producers, must be kept in a fairly warm temperature. Anything less than 60° F. is generally allowed to act prejudicially in this respect. In a big, airy byre, without artificial aids for heating the air contained therein, it is absolutely impossible during winter to maintain such a temperature. It cannot be done when the heat which radiates from the animals has alone to be depended on for keeping up the temperature. It can, however, be more nearly approached when the circulation of air out and in of the building is reduced to the minimum. And, as most of us know, it can both be reached and surpassed in any small-sized and badly-ventilated building. Hence the preference of small-sized cowhouses to large ones, as well as the dislike of having fresh air circulating within the same, on the part of the average owner of cows.

Artificial Heating of the Byre.

Those of the health officers who have grasped this state of matters think to solve the problem by inaugurating big, well-aired byres, artificially heated. But the country in general is far from being ripe for that yet. It would entail increased outlay on the part of both landlord and tenant—on the landlord for the fitting up of heating apparatus at least, if not for enlarged byres as well; and on the tenant for fuel and labour in keeping up heat. The burden of attending to a matter of this kind would, we are afraid, fall upon the tenant himself if *he wanted it carried on satisfactorily.* He would, in most cases, *get the baby to hold. But what need is there for heating up* the byres all and sundry? The cows are never all giving milk during the cold weather. Only a very few of them, taking the country in general, are due to calve before the spring months.

The uncalved cows are under no necessity of being subjected to the same degree of heat that experience teaches is beneficial from a milk-giving standpoint to those which have calved. It is hardly fair, therefore, not to speak of the false economy underlying the business, to parboil the lot in order to keep a few of them at the paying temperature so far as they are concerned. If it is absolutely necessary to keep the minority surrounded with air of a certain temperature, then the better plan is to keep them in a place by themselves, where the temperature could be controlled as desired.

The uncalved cows would then be able to breathe a purer atmosphere. The attendants would not be under the necessity of stinting them of fresh air; consequently their health would not be sacrificed for the sake of coddling up the milk-yielders.

This arrangement of providing a sort of casual ward for the benefit of the cows that calve during winter would be sensible, and be much less expensive than spending money over what there is no immediate call for. There are, of course, exceptionally managed dairies—such as town ones, pure and simple, and those that act as sources of supply to town customers—in which there is rarely to be seen, either in winter or summer, a cow not in milk. It is in cases of this kind that the heating apparatus is required in byres. With it as an aid there would be need of shutting out pure air. It enables warmth and fresh air to go hand-in-hand. But in the country byre there is no more need for it than there is for a third wheel to a cart. The "casual ward" would do all the turn; and this may be a building capable of holding only a few cows. It would be a simple matter to provide hot-water pipes for a place of this kind, in comparison to equipping the ordinary cowhouse in a similar manner.

The Byre in brief.

We are now in a position to review our up-to-date, but all the same plain and inexpensive, though most acceptable, cowhouse, where the health and comfort of both man and beast are taken into consideration. To begin with, it has a floor smooth and comfortable to lie upon. No wetness of any kind can either lodge on it or percolate through from above or below; nor can it ever absorb, and afterwards give off, obnoxious smells. And it can be cleaned at a minimum outlay of labour, without the slightest temptation either to do the thing by halves. It can be flushed out with water in a minute or two, and thus be rendered as clean as when newly laid. The windows being all in the roof, looking to the vault of heaven, there are therefore no window-sills to tempt one to lay odds and ends there to lie and gather dust. The space within the building is as free as possible of all unnecessary obstructions against the circulation of air and the diffusion of light. Light is admitted from above, and whenever the sun shines some part or other of the house is receiving its beneficent rays.

Provision has been made for the admission, when wanted, of abundance of air from outside, either by way of the wall-head openings or the skylights, both of which can be controlled at pleasure; the ridge openings serving at all times to keep the roofing wood in order, if not to promote the general circulation of air throughout the building by acting as a continuous link between the air within and the air without. Further, the stall divisions are such as to cause the least discomfort possible to the cows, and their feeding-troughs are of a description which ensures wholesomeness in every way. What more can be asked for by the most fastidious health officer or the most exacting stock-owner?

And all this can be accomplished for very little more money than it takes to erect and fit up the usual kind of byre met with in our dairy districts. In this, our suggested house, where the matter of air supply can be kept so thoroughly in hand, there is no necessity, as we have remarked before, of providing any undue amount of cubic space per cow housed therein. The attendants are able at will to increase or diminish the supply in accordance with weather conditions. This cannot be done in the instance of the ordinary cowhouse. The air supply, where it is concerned, must remain very much a fixed quantity, with the consequence that while under some meteorological conditions it answers well enough, in accordance with others (by far the larger number unfortunately) it is quite at sea.

This is, we suspect, the reason of our men in authority having enacted that cowhouses must be of such dimensions as to provide a large amount of air-space for each animal. They go on the principle, as we have already hinted, of enforcing a large supply of air to start with, trusting to chance for its being kept in breathable condition. And this is quite an excusable conclusion, for one would naturally think that a big place would keep longer pure than would a small one. But the air within cannot be kept pure unless by gradually renewing it from without. If the air has therefore to be renewed, and further, if it is quite practicable to do so in such a simple and inexpensive manner as we have pointed out, and it is easier done in the case of the smaller house, why make the byre any larger than there is absolute need for? The bigger house, capable of being well ventilated, is colder, and, what is more, is stuffier than the equally well ventilated but smaller one, because in the former the attendant, in trying to keep the place warm, lets in the smallest amount possible of fresh air. In the other, where the heat is more concentrated, and there is less risk of lowering the temperature, fresh air can be let in more profusely. There is reason in the matter of size as there is in other affairs, and the right road to pursue is perhaps the middle one.

There is a happy medium which, if it could once be struck, ought to please the various conflicting interests. Big byres, in conjunction with low temperature, recalls to mind a remark which was addressed to us the other day by a worthy Ayrshire farmer, accustomed to small and cosy rooms, who had been to visit a town relative who had built to himself a large and handsome villa. "Man," said he, in demonstrating the exceptional height of ceiling and size of room he was shown into, "ye wad think when ye tuk aff yir bannet that ye were oot in the open air, it felt sae cauld on the heid!"

The other Dairy-houses.

Coming now to the other places which, along with the cowhouse, form at the farm-steading the group of dairy buildings or offices, we find that the satisfactory placing of these is almost a more important point than the technicalities that are involved in their construction.

The *relative position* of one to the other, and of each to the whole, requires to be dealt with both as regards sanitation and convenience of working. At the ordinary Ayrshire farm it is easy to see that in arranging the offices convenience has been studied, at the expense very often of sanitary laws as now set forth. The house, in nearly every case, communicates either directly or indirectly with the byre. The passage between the two nearly always serves for access to the milkhouse and the other dairy offices—viz., the scullery or washing-up place; and the vat-room and cheese-ripening room, if it be a cheese-producing farm, or the churning and making-up room, if it be one at which butter-making is the branch of dairy industry practised.

While these buildings may be held as subservient to the byre, they must, all the same, be kept as distinct as possible from it, for reasons that must be obvious to every one. Milk, as we all know, is peculiarly liable to be injuriously affected by taints and odours that may happen to be floating about in the air, and from what of this treatise that has gone before it will surely have been gathered that the atmosphere of the cowhouse is one to be avoided where the storage of milk is concerned.

Much the same holds good where the manufacture of the several commodities derived from milk goes on. It is good neither for butter nor cheese to be subjected during the different stages of their manufacture to any but a comparatively pure atmosphere. Air derived from the farm kitchen is not desirable in these places either. Cooking is nearly always proceeding in that scene of activity and bustle, the odours whereof are almost certain to accompany the air that drifts out of the place. And let the housewife be ever so cleanly, dust too is ever on the move with every air-current from the house. These are the two chief sources of pollution to be guarded against in seeking to keep the atmosphere of the dairy offices as pure as possible. There are others, but they are more easily dealt with.

The pig-houses, the dunghill, and perhaps the stable, are all sinners in this respect. At the average steading the lot have apparently been huddled together without bestowing a thought on sanitary affairs. The aim seems to have been to save stone and lime, and wherever the side of a building could be utilised to clap another against it. No one can object to the idea of concentrating the buildings so as to save labour as far as possible. But it is poor economy planting building against building to the obstruction of the free access of air and light to each one separately. Light and air are enemies to the many fungi or moulds that love to lurk about inaccessible corners, and which bring decay to any timber they can settle upon.

The dunghill ought in every case to be at the end of the byre opposite to the one at which the dairy-houses are situated. The pig-house, too, ought to be well out of reach of offence to the dairy offices. The stable is less offensive than either of these two, and it rarely happens that its position causes it to do harm in this way. There is another common offender which we have overlooked, that is, the boiler-shed, where the cooking of food for the animals goes on Very often it is erected without any regard being paid to its proximity to the dairy.

How a New Set of Buildings might be arranged.

Had we the arrangement of a new place we should plan the buildings something in accordance with what is represented in fig. 22. In it the dung-stead and pig-house are together at the end of the byre away from the dairy. The boiler-shed is at same end, and contiguous to a root-house on one hand and a meal or cake store at the other. The straw-barn or straw-shed we would have placed as conveniently as we could for serving the byre. At the other we should have a through passage, which would help considerably to break off the air connection between the byre and the dairy-buildings, and yet interfere very little in the communication between the two. Some sort of light roof or hood could be erected from one doorway to the other to keep rain from those who had to pass from byre to scullery.

The first of the dairy offices would be the scullery, or room in which the various utensils of the dairy are washed and scalded. This could either be entered directly from the passage or by going round the corner and in at the side. Next to it, if a cheese-making dairy were in question, would be the vat or cheese-making room; and succeeding it the milkhouse. All three could either be made to communicate one through the other, and in this way have access under cover from milkhouse to byre. If, however, more thorough isolation were desired, the doorways shown in the partitions could be built up and access had to each place separately by means of the doors under the covered verandah dotted in on the plan.

The cheese-room could be placed overhead of the scullery and vat-room, access being gained thereto up a trap-ladder in one of the corners. We have shown no press-room, but space enough for the presses might be allowed in the vat-room. Were this not very practicable, a small room would have to be abstracted from the space set

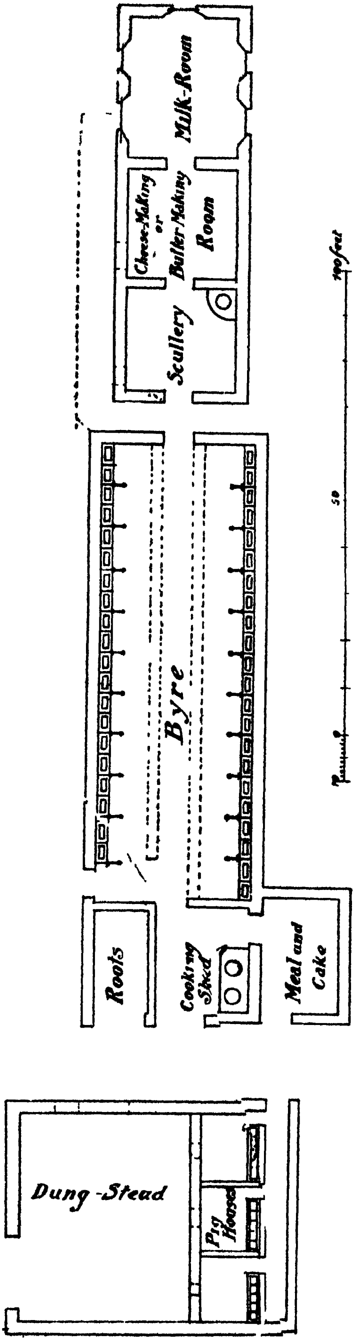

Fig. 22 —Dairy-buildings—ground-plan.

out for the scullery and the vat-room. If the cheese-room were put elsewhere, we would prefer to have the scullery and vat-room constructed without a ceiling and open to the roof, the roof being made on the principal system. We then have airy rooms, and so get easily rid of all steam and superfluous vapour.

The milkhouse we would have constructed with a ceiling, in order to be the better able to keep the temperature under control. Were the dairy a butter one, the vat-room would answer the purpose of a churning and making-up room. The other offices would remain as they are. In the latter case the range of dairy offices would be one storey high, in the other they would be two. It would hardly be worth while to put an additional storey over the scullery and press-room without continuing it over the milk-room as well. The whole space would not be required for a cheese-room; but the rest would not be wasted. A good bedroom for either boys or girls would be available here, and be gladly taken advantage of.

Our plan would, we are afraid, hardly meet with acceptance at the hands of the typical Ayrshire farmer. He, or at least his wife, would argue that such an arrangement as we propose would separate her too far from her bovine charges during the long hours of a winter night. She prefers to be within call of them if at all possible.

Remodelling old Buildings.

It is not often, however, that the farm architect gets the chance of projecting a new steading. It falls oftener to his lot to remodel or tinker up an old one. This proceeding calls for the display of more resource and practical knowledge of dairy work than the planning of an entirely new set of buildings does. He is then face to face with the difficulty of reconciling convenience in working with a due attention to the teaching of the authorities in sanitary matters. How most profitably to rearrange a huddled up lot of buildings, and yet have an effective set when done, most undoubtedly brings out the special skill of the estate manager. The most expert man in his business will solve the problem not necessarily at the smallest expense, but at any rate in the way best qualified to serve the ends in view.

If possible, it is well to cut off the byre from the other places with a passage, as before. If either the pig-house or the dunghill is in an objectionable position, it must be removed, whatever the cost. Should both be in the road in this connection, then both must go. No high-class product can be steadily turned out of a dairy liable at any time to receive wafts of wind leading directly from either one or the other. The cooking-shed must also be seen to in this respect, and, if likely to be harmful, be removed to some other site. Next we have to make certain of the admission of plenty fresh air to the dairy offices. Currents of air are wanted in the scullery to remove the steam that is characteristic of the place; and abundance of air is wanted in all the other places as well.

Ventilation of the Dairy Offices.

The ventilation of the dairy offices proper is on a somewhat different footing from what we dealt with when discussing the byre. In the byre the promotion of air-currents is for the purpose of getting rid of the air that has been breathed, and replacing it with pure air, so that the animals may be maintained in a healthy condition. In the milkhouse currents are induced not because the air within the room is being used up, but because stagnant air is conducive to the welfare of moulds and microbes, and these are inimical to the interests of the dairyman. They interfere with the proper ripening of both the milk and the cream, at the expense of the microbes that he wishes to encourage. Thanks to science, he is now in a position to control to a certain extent the influence of the various organisms which love to gain access to milk. He knows, at least he is led to believe that he does, which of them are useful in promoting the various changes that milk has to go through in the various stages of its manufacture. He strives to checkmate all and sundry of the others. Some of the latter, he is told, may be good, but they form a small minority. Most of them, however, are, if possible, to be avoided. In seeking to do so, his aim is to choke off all, good and bad alike, that come under the categories of "dangerous" and "doubtful."

The skilled dairyman endeavours, to begin with, to have the milk conveyed to the milkhouse in as pure a state as possible with regard to the presence of organisms in its bulk. Preparations are now available to him wherewith he can seed the milk with those microbes that are conducive to favourable results in the different processes he takes in hand. While offering these as fair a field for their propagation as lies in his power to give, he at the same time does all that he can to oppose the ill effects of the others. He cannot kill them off entirely. They get into the milk in spite of all he can do. They fly about amongst the dust within the byre, some of which is certain to attach itself to the milk. They drop into the pail with the hairs and scurf that are brushed from the cow's skin during the act of milking. The hands and the clothes of the milkers are futile agents in the dissemination of them. And even in the angles of the luggies, unless carefully scalded since being last used, they lurk, ready to assert themselves at the first opportunity that comes their way. Milk, therefore, no sooner is drawn through the teat than it becomes the prey of countless tiny organisms, each species of which is bent upon turning the susceptible fluid to purposes of its own. The dairyman, too, has an axe of his own to grind, and according to methods of his own choice. No sooner, therefore, does he abstract the fresh milk, than forthwith he sets about guarding it from the effects of those lurking foes that are in readiness to forestall him.

Points bearing on the Milkhouse.

Once safe in the milkhouse, the milk is more out of their influence than can be looked for in the byre. The milkhouse, however, must be of such a description that it will enable the dairyman to proceed on the lines best calculated to promote his interests. What these are will have been slightly gathered from the foregoing. It must, in addition to being beyond the influence of tainted air liable to affect the milk, be free from both dust and damp. Where dust is, there are abundance of germs also. Not but what the latter are plentiful enough in air in which dust is imperceptible to the eye. But in air which reveals to our senses dust in suspension and drifting about at the mercy of every current, these dust particles are bound to have an innumerable and very mixed following of germs whose presence is not at all desirable in the milk-room.

The dairy operative is now so far advanced in science that he seeks, as remarked above, to be in a position to control the admission and regulate the working of the various species of microbes that induce change in the constitution of milk. He wants to keep at bay all those that wish, on their own account, to gain a foothold in the milk and work their own sweet will therein. We have already pointed out how difficult of accomplishment this is. In fact, it is impossible to do so completely. Yet when every reasonable precaution is taken against the germs obtaining an undue advantage at the various stages between milking and the manufacture of the different dairy commodities, much is gained in the struggle against these insidious competitors for a position from which it is possible for them to have a hand in the pie.

And if dust be an enemy to the contents of the milkhouse, dampness is even a worse one. It brings in its train organisms which have a more pernicious effect on milk than the usual sort that drift about on the open wind. Those that issue from damp and stuffy corners can bring nothing but evil to the milk they gain admission to; the others may cause no further trouble to the dairy worker than to force his hand by hastening on some process or other quicker than he wishes. The dampness we refer to is that due to bad workmanship in the erection of the building, or to neglect in attending to the necessary repair of some defect whereby rain finds access either through roof or wall. It is out of a damp place of this description that lowly organisms of a fungoid nature have their origin. When the air around such a damp spot is still or stagnant, circumstances are all the more favourable to the emanation of harm-causing germs therefrom. Currents of air playing over and around a plague-spot of this kind minimise its power for evil over milk and its products. It requires shelter from draughts before it can act as an effective nursery for lowly organisms. But it does not altogether require the kind of dampness due to some defect in the building to introduce a foe into the milk-house. Any building not artifically heated is certain to be at times naturally damp in a climate such as ours. But given two buildings unprovided with any heating apparatus, one of them with air free to circulate all about it and the other in which the air is almost stagnant, we all know in which of the two anything kept therein will suffer first from the effects of damp. Similarly it is in the dark, unventilated closet, and in the still corners of our rooms, where, for instance, either books or boots grow mouldy.

Let wind have free access to them, and the minute fungi will have greater difficulty in establishing themselves. Applying this to the milkhouse, the inference is that we ought so to construct the place that air is always at liberty to circulate throughout the room, and prevent stagnation in any part of it. Where such a condition of affairs holds good, milk placed therein is very favourably situated, provided of course that this abundant supply of air comes fresh and pure as regards either dust or taint.

The Milkhouse.

Turning, however, to the construction of the milkhouse, it may be either of brick or stone, as circumstances dictate. Circumstances rule also the position of the place in relation to the other buildings.

These matters having been decided, we have next to take into consideration the important point of the aspect of the room. It is well to have it placed as far as possible out of the direct rays of the sun. A milk-room exposed much to the sun is liable to a greater range of temperature than is desirable. It is not practicable to shut it off altogether from the sun's influence in this way; not that it is impossible to do so, as any one who has seen a country icehouse can judge for himself. But the milk-room at the steading has to be taken as a part of the whole, and must be humoured into accommodating itself to the general arrangement of the other offices. It ought, when it can be managed, to be exposed northwards or eastwards, and thus be well away from the midday sun. The room is all the better for plenty of light. Sun rays are inimical to germ life, and on this account plenty of daylight is desirable in the milk-room. It is not necessary that the sun should shine directly into the place. Light from the north or from the east is equally an enemy to lurking microbes and germs of moulds; and daylight is in every case a revealer of matter in an improper place. It shows what happens to be left, either through inadvertence or laziness, in corners and under tables and shelves. We want, therefore, a dry structure, not much exposed to the sun; but, all the same, well lighted up by means of windows, and so arranged that abundance of fresh air can as desired be made to circulate throughout it.

The building, as we have already said, may be either of brick or stone. Any of the side walls that communicate directly with the outside air ought to be plastered on lath. It is impossible to keep the inner surface of an outer wall dry should it not be strapped and lathed. The surface will be dry enough in the spring months, but during the remainder of the year it cannot be. If the building be of brick, and the walls are built hollow (that is, carrying up a free space of 2 or 3 inches in the interior of the wall, the outer row of bricks being, say, 9 inches, and the inner row 4½ inches thick, the two rows being tied together with galvanised iron straps), there is then no need of strapping and lathing. A neat point of the joints, provided the bricks are smooth and close in the grain, is all that is required when both outer and inner walls are concerned. But if the bricks are rough, the whole interior surface of the walls should be smoothed off with lime-plaster in the ordinary manner. This affords a smooth surface on which dust has little chance of lodgment.

The same, of course, holds good where the walls are built of stone. They, in every case, however, must be plastered all round, the outside walls being lathed.

The Ceiling.

The ceiling, too, ought to be plastered. It should be kept low enough to ensure a good space being left between it and the roofing-boards. This serves as a non-conductor to tone down what heat the slates pass in on a bright day, and what they draw up and radiate into space in cold weather and by night. It answers no special purpose to keep the ceiling much above the level of the wall-heads; neither is there any necessity to keep the side walls very high. With a free movement of air throughout, any extra height beyond an ordinary workaday place is quite superfluous. A thatched roof, which projects well over the eaves of the building, makes an ideal covering for a milkhouse. Its use, however, can only in very exceptional instances be made available for such a purpose.

A ventilating shaft communicating between the interior of the house and the open air at the ridge is essential. This makes certain that the air next to the ceiling will be kept on the move. And the upward current in the ventilating shaft will draw air to itself from the other parts of the house. "Hit-and-miss" galvanised iron ventilators, such as are in use for ventilating the space underneath ground-floors of houses, should be built in the walls so as just to clear the floor-level.

This arrangement will prevent any stagnation of air about the floor. It is advisable, if at all practicable, to have these in each of the four walls of the house; but their use may be suitable in the outer walls alone, unless the passage past the milkhouse be of such a nature that air admitted from it to the milk-room will be beneficial. But we have already tried to impress on our readers that this is a most important point with regard to the milkhouse. If the air at the outside of that portion of the walls enclosing the milkhouse is not above suspicion, it is evident that it cannot be kept out. It will gain admittance freely underneath and all round when the door is shut; and when the latter is full open the milk may almost as well be in the passage itself. Floor-ventilators of the kind referred to, if in only three sides of the building, will ensure a full circulation of air at the floor-level. In fact, if judiciously arranged in two sides of the place, there is little fear of air being allowed to remain undisturbed in the corners even.

The ventilator itself may be built either in the outer or inner face of the wall. Our preference is the outer, if it be not too far to go round to the outside to open or close the slide when either proceeding is rendered necessary. They are easier got at from the outside. If the house be built and maintained in accordance with sanitary laws, the floor will be higher than the soil outside, and the outer face of the wall will be free both of loose stones, sticks, and similar accumulations, and of all natural obstructions, such as docks, nettles, or tall and coarse grasses. The wall outside will therefore be fully exposed down to the ground, so that very little exertion will be expended, or inconvenience caused, in attending to the ventilators when they are built in the outer face of the wall. Inside the room the ventilators are about level with the floor and under the shelves, and in consequence sometimes rather awkward to reach. That part of the opening which is opposite to the ventilator itself ought to be protected with copper-wire cloth. This, while keeping out flies, &c., will not impede the current of air to any very serious extent.

Frequently we come across these wire or perforated-zinc guards whitewashed over, their efficiency being thus completely destroyed, and the passage of air wholly arrested. It ought hardly to be necessary to add, the sides of the ventilator openings should be smoothly plastered, either with lime or cement.

For lighting purposes the ordinary sash-window hung both above and below suffices. The movable sashes allow for the admission of extra air when that is thought desirable. There may be as many windows as there is reasonable room for. These can only be, of course, in the proper place when inserted in the outer walls. Something is out of joint when "borrowed light"—that is, light derived from a passage or an adjoining room—is called into request for the milkhouse. An ordinary linen blind, hung inside on a roller, is needed for those windows on which the sun shines during parts of the day. A sort of louvred arrangement, hung on hinges, and covering over the outside of the window-frame, is perhaps better, keeping as it does the direct rays of the sun quite at bay; but it is more expensive both to fit up and maintain. The blind seems to answer in the generality of cases. Only some of the windows require blinds, but all of them ought to have frames covered with copper-wire cloth fitted tight into the window opening outside. This, as in the case of the bottom ventilators, prevents flies buzzing out and in at discretion when the windows are opened. It is bound, besides, to keep out a certain proportion of dust and matter carried about on the wind. For similar reasons the opening of the ceiling ventilator should be safeguarded with material of the same kind; and it is well to have some means, such as a sliding-board workable by strings, of contracting or closing altogether this orifice.

The Floor.

The floor ought, without hesitation, to be laid with Portland cement concrete. And a skirting of cement, 5 inches or so deep, and say 1 inch or ¾ of an inch thick, may with advantage be carried all round the base of the walls. The pre-eminent good qualities of concrete as a flooring substance for farm buildings, notably its property of keeping down ground-damp, and its being one continuous sheet—smooth, hard, and endurable—we have already descanted on.

The Shelves.

The shelves are usually of stone, either sandstone, flagstone, or slate. For preference we would have them to be of open ironwork, gridded or of a diamond-shaped pattern. This would further carry out the continuity of our policy of seeking to have everywhere in the room a constant movement of air. This is hindered a good deal where the shelving stands out nearly all round the room in thick and solid slabs, leaning on supports of the same nature. It is not so bad where the shelves are borne by open brackets. But let the shelving be of open iron- or steel-work on open brackets of the same material, and there is little, if any, obstruction to the circulation of air. Even when the milk-vessels are in place, air is free to pass up or down through the shelves and round the various dishes. There are no dark, still places close under the shelves when these are of open work. All nooks and corners are then under the influence of light and air, and open to the quick eye of the cleanly housewife or dairymaid. These shelves can either be galvanised or painted; but once a demand arises for them we shall soon have light, yet strong, enamelled ones at our service, than which nothing of this kind can be more desirable.

A Good "Workaday" Milkhouse.

A suitable everyday sort of milkhouse, well adapted for the requirements of the farmer who has to pay the rent and earn a livelihood for himself and family out of the holding, and which at the same time will gain favour in the eyes of a fastidious sanitary inspector, if not indeed from an enthusiastic medical officer of health, we may now, in accordance with the foregoing, briefly define something after the following terms:—It stands clear on three sides, if possible, or at the least two, from other buildings, occupying a site not under influence of taints or unpleasant odours. It is amply ventilated at floor-level and at the ceiling. It is well lighted by means of windows, with sashes movable at will should the entrance of more air be at any time wanted.

All the openings communicating with the outside air are safeguarded with copper-wire cloth, and they may at any time be reduced in area or be closed entirely. The door communicates with a passage, the draughts of air from which are not liable to act prejudicially on milk. The floor is jointless, smooth, hard, and impervious to moisture. The walls are smooth and dry; likewise the ceiling. The shelves are light and of fretwork, instead of being represented by solid slabs of stone. What other matters are needed in order to comply fully with the various requirements spoken of we cannot suggest, not at any rate in the instance of the let-farm. At the home-farm more money could be spent over the construction of the milk-house by way of tiling and so on. It would only be, however, at the dictates of taste. No greater efficiency, either in the matter of saving labour or in enhanced quality of dairy products, would, we think, be gained in the end.

The Scullery.

Next in importance to the milk-room is the cheese-room, or room in which the cheeses are set out separately on shelves to slowly ripen. But it may be as well perhaps to deal first with the less important places and leave it to the last. These are the scullery or washing-up place, and the vat-room and the press-room, if the farm be a cheese-producing one, or the churning and making-up room, if it be one at which butter is the commodity produced. There is nothing of particular moment to be noted with regard to any of these. A good floor is of course essential in each—one that will stand a knock, and on which spilt water will have no effect—and here again concrete comes in as a valuable ally.

The outer walls of the scullery need no lathing. In fact the walls all round should be plastered, say 5 feet up, with cement, the remainder being finished as usual with ordinary plaster or neatly pointed. There is usually so much steam and wet, and so much banging about of butts, churns, and various dishes, that a cement dado all round will be profitable in the end. On account of the steam and moisture incidental to the place it is advisable to have the ceiling, when the room cannot be made open to the roof, lined with wood. This, if varnished, will stand longer than a plastered one. The continuous dampness of the air of the scullery is very trying to a plaster ceiling. If the floor overhead be constructed on the principle described further on under the head of the cheese-room (see fig. 25), no ceiling of any kind will be needed.

It is needful that there is plenty of light and air in the place. Ordinary sash windows serve both ends; and equally well do opening roof-lights where the ceiling can be dispensed with. One is powerless to deal with the steam rising from the water being used in cleansing the dishes and scalding the various utensils; but that which issues from the boiler can for most part be conducted into the furnace flue either by means of a hood erected over the boiler or by a pipe leading through the fixed part of the boiler lid.

The Vat-room.

The vat-room is much on the same footing as the scullery. There is generally a boiler in it for the purpose of supplying hot water for running into the jacket of the vat in order to control the temperature of the milk. Cold water is used for a similar purpose. Water is therefore being spilt here and there—so are milk and whey. On this account a floor that is smooth and hard and can be easily cleaned, that will absorb no moisture, and therefore cannot become tainted, is invaluable in the vat-room; and such a one we have, as already said, in concrete. It is an advantage to finish the walls as suggested in the case of the scullery. The outside walls need not be lathed unless for sake of appearance. Wherever these are unlathed they will be liable at times to show damp patches, not that these will here cause any harm. Lathing the outer walls previous to plastering will of course obviate that. Ordinary windows will yield all the light and air needed in the vat-room. It is a place, however, that at times is all the better for having a good current of air passing through it. Here, too, the ceiling had better be lined with wood in preference to being plastered, for there is usually a good deal of vapour about the place, arising as a result of the operations connected with the vat and also issuing from the boiler. Much of the latter can of course be led directly out of the room in the way spoken of in connection with the scullery boiler. This room is all the better, too, where it can be accomplished, to be open to the roof. It is not often practicable, however, to have it so.

No Covered Drains should be in Scullery or Vat-room.

Neither here nor in the scullery is it advisable to have drains led in beneath the floor with an opening up to the same. Trap such a drain as efficiently as possible, there is still the likelihood of taints issuing forth occasionally from the grating over the inlet. It is better to have an opening through the wall at floor-level, with a drain inlet outside. If the floor is given an inclination from each side to this hole in the wall, any liquid that may be spilt on the smooth concrete will speedily make for the exit and find an easy way to the drain outside. This outlet, it ought by this time to be unnecessary to repeat, should be finished smooth and made impervious to moisture in the manner we have called for everything of the sort to be done. A drain inlet somewhere on the surface of the floor of the scullery may be pardonable. More water, some of it often at a high temperature, is being used in the scullery than in the vat-room, which means of course a better flushing of the drain therein.

In the vat-room, however, there is less water and more milk and whey found about the floor than in the scullery. There may not, indeed, be more of the last two mentioned, but on the scullery floor what there is of these substances are diluted past recognition in water. But if pardonable in the scullery, which we very much question, it is by no means allowable in the vat-room, where the curd has to be exposed to the air at different stages, and is at all these critical times very susceptible to harm if subjected to such odours as those that are allied to sewage gas—which may indeed proceed at any time from a drain of the kind referred to.

Churning and Making-up Room.

Where butter-making is the leading process of the dairy the churning-room takes the place of the vat-room. What we have suggested to be done in the way of finishing the walls and floors holds good here, and need not be reiterated. This place is, however, more on the footing of the milk-room than the two last mentioned. It requires to be kept cooler than these. The rules we have laid down to be observed in the construction of the milk-room ought, therefore, to be followed out pretty much in this instance. The place ought to have an aspect away from the sun, if that be practicable. In ventilation, too, it ought to be as well fitted up as the milk-room. For the latter we advised allowing for the admission of air at the floor-level as well as by the windows, and having an air-shaft carried up through the ceiling to the ridge of the roof. Here also we would have the various openings communicating with the outside air, including the windows, protected by means of copper-wire cloth.

Very little vapour of water being present at any time in the churning-room, only when the churn is getting rinsed out with hot water there being the chance of any showing itself, a plastered ceiling is preferable to a wood one. The side walls we would also recommend to be plastered, the outside ones previously being lathed for the purpose. If the inside walls were of hard clean-made bricks, and neatly pointed, there would be no necessity for plastering them. They would be quite smooth enough under these circumstances, and an occasional coat of whitewash or distemper would smarten them up and keep the place pure. But in the case of brick walls it would also be advisable to lath and plaster the outer ones, unless, of course, these were built hollow, as described under the head of the milk-room. The shelving we would have constructed on the same principle as suggested for that of the milk-room. Here, too, the most suitable kind of floor is a concrete one—cool, clean, impervious both to dampness and taint.

Very little water being ever spilt on the floor during the course of the different operations, any drains are unnecessary in connection therewith. It may be necessary to have water led into the place. In that case the tap can be over an enamelled sink, draining right through the wall and efficiently trapped.

The Cheese-room.

We are now back to the room in which the cheeses are set out to ripen. This may be either on the ground-floor or upstairs. Our preference is for the latter arrangement, but why—unless from the fact that the room is almost certain to be lighter, airier, and drier upstairs than on the ground-level—it would be rather difficult to tell. Throughout Ayrshire many of the cheese-rooms are on the ground-floor, and as good cheese has come out of some of the rooms so situated as ever was ripened in an upstairs room. Some of the leading makers, as well as successful prize-takers, have their cheese-rooms on the ground. They might, of course, have been even more successful had they been able to ripen their cheeses in a room one stair up. The essentials of the room as regards natural conditions are the two: that it be dry, and that it be not liable to extreme fluctuations in temperature.

For instance, it is unfavourably placed if the sun during a bright summer day unduly raises the temperature of the room and sets the cheeses a-glistening. And, on the other hand, a room in which this can take place will be as ready to part with its heat when the air outside grows cold. There is less danger of a room on the ground-floor coming so much under the influence of fluctuations of temperature as the one just instanced. The lower one is less likely, however, to be as dry as the other. And the susceptibility to change of temperature in the upper one is after all very much a matter of construction. If felt be placed under the slates, and these be selected of as light a hue as possible, and the ceiling be kept well down from the slates, both the heat by day and the cold by night will be pretty well defied. The lighter coloured the slates are the less heat rays will they absorb. The layer of felt will increase the non-conductive properties of the roofing-boards; and the bigger the body of air filling the space between the roof and the ceiling, all the better protected from the changes that go on without will be the room beneath.

Light and Ventilation of the Cheese-room.

We believe in abundance of light within the room, and contrive, if possible, to have windows at either side. Light is prejudicial to germ life; but the minute organisms which make up that world are not of so great moment in the air of the cheese-room as they are elsewhere in the dairy. If cheese does, as supposed, ripen under the influence of some of these, the seed must have been implanted at a previous stage or stages of manufacture. It can hardly be absorbed to any extent after the curd has been pressed into the dense consistency of matter peculiar to a well-formed cheese. With sash windows arranged at either side it becomes, of course, easily practicable to regulate the admission and flow of air within the room. It is advisable to have, in addition to these openings, an air-shaft leading from the ceiling to the ridge, and communicating there with a double-horned zinc ventilator of the kind previously referred to. This opening in the ceiling it is well to have the means of regulating or closing, according to circumstances.

Walls to be thoroughly Dry.

The walls we would have made as dry as they can be, and to that end plastering would be a necessity, the outer ones being done on lath. The larger portion of the inner wall surface would be against outer wall if it were so built as hinted above, that both sides were free of other buildings and had windows fixed in each. The side walls had better be kept as high as circumstances—chiefly economical in this respect—will admit.

No Camp-ceiling if possible.

The less camp-ceiling there is the less influence will outside agencies have on the temperature of the atmosphere of the room.

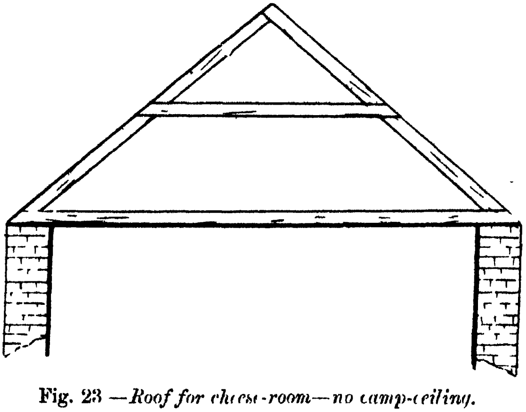

Fig. 23.—*Roof for cheese-room—no camp-ceiling.*

The ceiling, as a whole, will be farther from the slates the nearer it can be brought to one level. Figs. 23 and 24 will make the import of this plain. In the instance of fig. 24 both sunshine and frost will, it is evident, have greater influence on the air within the room than it can have on that of another constructed similarly to fig. 23. In the instance of the latter no part of the ceiling is in direct touch with the actual outer framework of the roof as those parts marked *a* on fig. 24 are. A good deal more building is requisite in the one than in the other; but the advantage of the same is obvious. A cheese-room, before it can be termed a first-class one, must first of all, as already said, be capable of being kept within a limited range of temperature; and one such as we have exemplified in fig. 23 can be done so more effectually than one after the fashion of fig. 24.

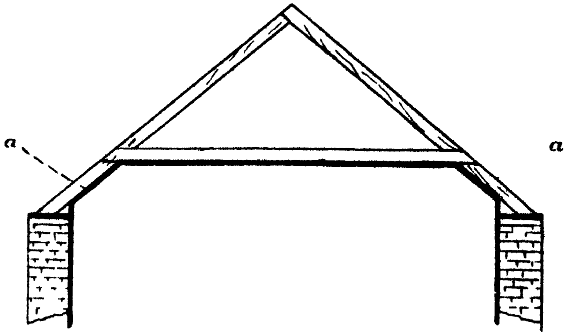

Fig 24 *Camp ceiling*

The Floor.

A very suitable kind of floor for the cheese-room is a double-boarded one, such as is shown in fig. 25. Two layers of flooring are used, and between them is placed a sheet of inodorous felt. This, when large joists are fitted up, makes a strong floor—a very essential point indeed where the cheese-room is concerned. By the time the shelves are filled with a season's make of cheese the floor of the room has several tons to support. The weight has, of course, to be sustained by the joists; but the double

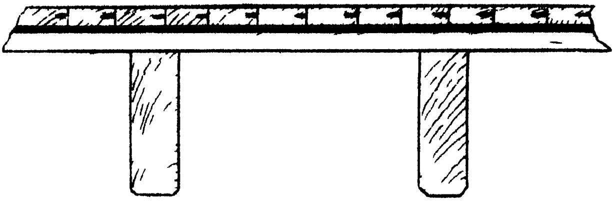

Fig 25.—*Floor for cheese-room—double boarded.*

layer of flooring helps to give rigidity to the whole. Moreover, the wood and the felt combined help well towards insulating the room from the other places which it happens to be overhead of. These, as mentioned on p. 91, require no other ceiling than the under row of flooring-boards, which, being laid with the planed surface down, look quite clean and neat, more especially if the joists have been slightly chamfered (*i.e.*, have their sharp corners taken off) and planed in unison.

When varnished, a ceiling of this description is both a pleasing and an effective one. There is no likelihood of plaster at any time falling from it; neither does it occasionally drop down a little dust as a lined one is apt to do. The two sets of boards are, as the fig. shows, laid at right angles to each other. The bottom ones must of course run contrary to the joists, and be nailed to and borne up by them. The topmost boards having of necessity to be nailed to those beneath, require for the sake of strength to be laid and secured in another direction to their supporters. Sometimes one or the other series of boards is laid diagonally with the building; but this proceeding means waste of wood at the ends of the boards, and is bad economy, unless it be done with a view to artistic effect in a case where money can be spared for such an object.

Ceiling to be of Lath and Plaster.

The ceiling, it will perhaps have been gathered, we would rather have of plaster than of wood. Where there is much moisture in the air of a building, varnished wood makes the most suitable ceiling; but where the air is normal in that respect, plaster is the proper material to use. In an ordinary sort of room having a wood ceiling of thin boards, the wood is certain in the course of time to shrink a little. By-and-by, after this has taken place, dust is apt at times to fall from the somewhat open joints. This would never answer in the milkhouse, neither would it be a desirable state of matters to have existing in the cheese-room, where it could be avoided.

The Room to be Vermin-proof.

Care must be taken when finishing the walls, floor, and ceiling of the cheese-room, that there are no crevices or openings left anywhere whereby mice may gain an entrance to the place. Once they gain admittance they are rather difficult, without the weak places in the structure affected being laid bare and afterwards put to rights, to keep in check. By the judicious use of cement at the floor-level, between wall and boards, when the floor is being laid, there is not much chance of the little rodents *getting in from beneath the floor. This, in fact, they can* hardly do at any time, unless the walls of the room underneath be plastered on lath. The space between the laths and the wall allows them to get up beyond the level of the floor overhead, unless they be checkmated somehow after the manner we have indicated.

Further, it is only where the ground-room floor is of wood that there is much likelihood of mice getting free access behind the plaster-work. As, however, all our ground-floors are proposed to be of concrete, there must be very few vulnerable points left for the mice to gain a footing upstairs from this direction. Only on account of great carelessness on the part of the occupant of the buildings, or of his assistants, could vermin of the kind ever become a pest. But when hindered from getting in from beneath they will seek to assail from above, if they can manage to approach the ceiling by way of the adjoining buildings.

Here again, however, they can with care be checkmated. A mouse or two can very soon reduce the value of a cheese, not so much on account of what they consume of it, but from the fact that the disfigurement which they cause to it seriously reduces its value. Once the skin of a ripening cheese becomes broken, decay soon makes its appearance, and spreads around the fracture. It seems a small matter to take up, this one about mice. But it becomes a big one if, after completion of the cheese-room, parts of the structure have afterwards to be torn down in order to make good what a little care at first doing would have guaranteed prevention of—a pest of such a nature.

The Shelves.

The shelving is the most important fitting of the cheese-room. The shelves require to be so arranged that they will allow the cheeses to get full exposure to the air of the room. The shelves are open both at back and in front, therefore the only part of the ripening cheese that is entirely cut off from the air is that which bears on the shelf. In order that this part may in turn get access to air, the cheeses are reversed once a-day; the end that was uppermost one day is undermost the next. It is both laborious and tedious work, this turning of the cheeses one by one, especially if there happens to be a big make to handle in this way.

Revolving or Reversible Shelves.

Revolving shelves are now, however, rapidly taking the place of fixed ones. These are arranged as a series of boxes or cages, each being hung on edge pivots, and easy of revolution. By giving one of these cages a half turn, and in this way bringing what was the bottom shelf to the top, it is evident that the cheeses contained in the shelves are at the same time similarly reversed. What, therefore, under the old system takes much time and hard work to perform, can, under the new one, be done both easily and expeditiously.

The cheeses are hindered from falling out of the shelves as the cage is being reversed by a special arrangement of spars at the back (see figs. 26 and 27). These bear up the cheeses when the cage is attaining, and again passing away from, the horizontal; and down these they gently slide, on to the other shelf, as the vertical is once more being assumed. The spars are placed in such a manner that they serve to keep the cheeses well forward on the shelf. There are usually but two of them to each cheese, consequently they can hardly in any appreciable degree restrict the play of air around the cheeses. We have never seen sparred shelves used, but what we remarked previously on the

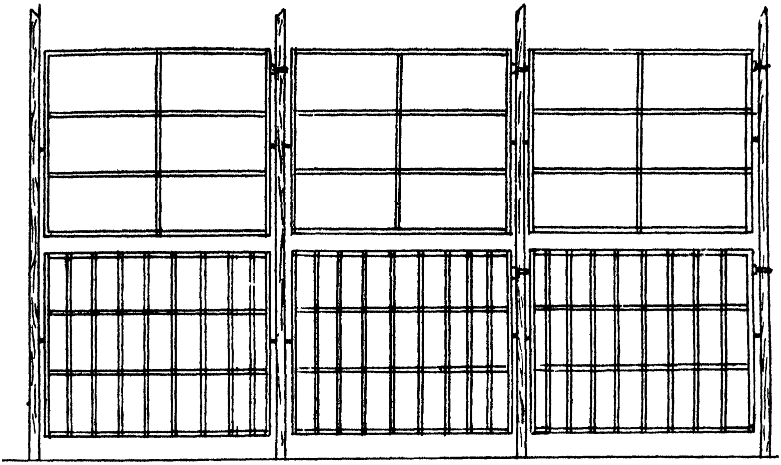

Fig. 26.—*Revolving shelves for cheese—elevation.*

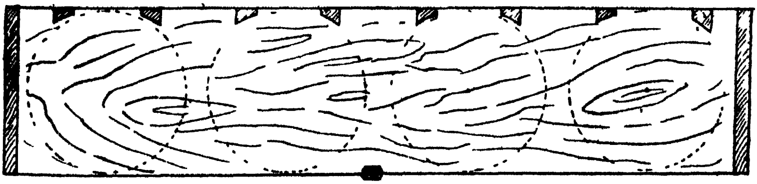

Fig. 27.—*Revolving shelves for cheese—plan of single shelf.*

subject of the shelves in the milk-room applies equally in this instance.

Both in milk-room and cheese-room, in order that the best results may be obtained, air must be at liberty to come and go as it listeth into every nook and corner, to circulate around milk and cheese alike in gentle currents, on its way removing with one hand the gases resulting from internal changes in the one or the other, and with the other hand yielding up the vivifying oxygen, and thus keeping at bay the harmful bacteria while promoting the interests of those that best help towards the proper ripening of the different products of the dairy. To the end therefore of better providing for this beneficial circulation of air, we think recourse might safely be had to the use of lattice-work or sparred shelving. Were such in force there would be a freer play of air all round the different cheeses alike. Neither the bottom, the top, nor the sides of the different cages would offer obstruction to the flow of air around the respective cheeses. None of them would, as may happen under existing arrangements, ever be so situated as to be on the lee side of a board and consequently in somewhat stagnant air.

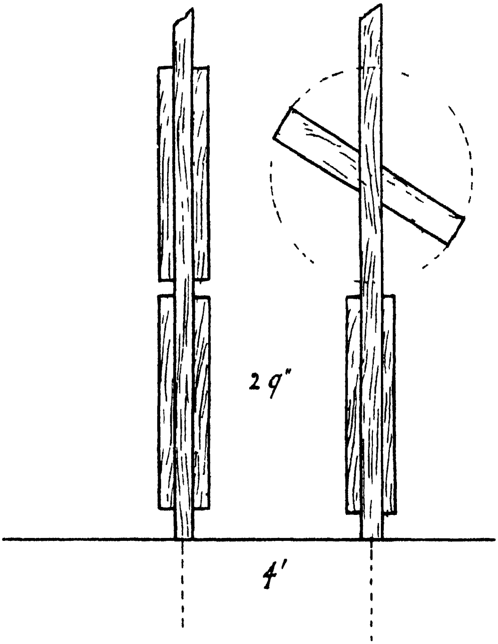

Fig. 28.—*Revolving shelves for cheese—end elevation.*

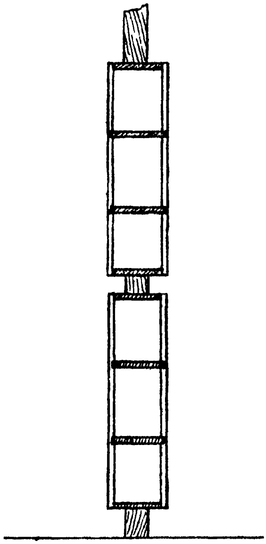

Fig. 29. *Revolving shelves for cheese—vertical section.*

Where the shelves are fitted up on the old system, it is common to see a set of them arranged round against the walls. There cannot be much movement of air in the recesses which shelves of that sort are bound to form.

Fig. 26 represents the elevation of a series of turning or reversible shelves, arranged as six boxes or cages, each arranged to hold four cheeses, the front side of the upper three shelves and the back of the lower set being shown. Fig. 27 gives on a larger scale the plan of a single shelf, with the position taken up by the cheeses.

The vertical spar on the front of the shelves acts as a stiffener.

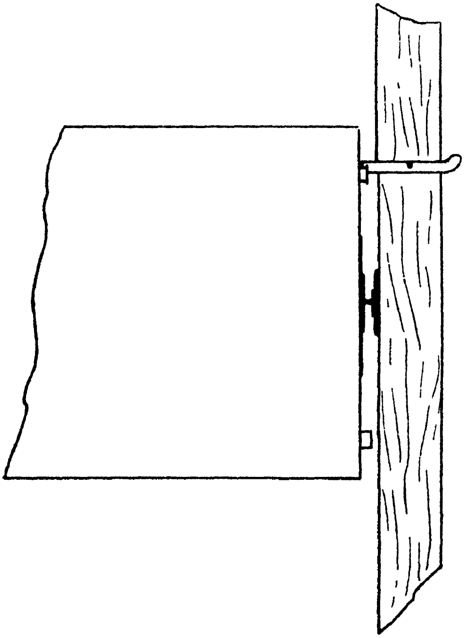

Fig. 30.—*Revolving shelves for cheese—showing how the boxes are hung.*

Those behind, while there to keep the cheeses in place when the cage is being turned, serve a similar purpose. They are either half checked and nailed or firmly screwed to the shelves. The shelves are either dovetailed or checked to the sides. Put together as described, the boxes are firm and unyielding. Wood 1¼ inch thick is used—either white or yellow pine.

Fig. 28 gives the end elevation of the shelves in fig. 26. With the standards set up at 4-foot centres, 2 feet 9 inches of space between the boxes is available. Less room will, as the fig. shows, allow the boxes to be turned without obstruction, but it is better to have a wider space between the respective rows than anything below the figure quoted. Fig. 29 shows a vertical section through one or other of the two boxes in the series.

In fig. 30 we see the manner in which the boxes are hung from, and how they are latched to, the standards.

Fig. 31 shows the usual fittings that are on each end or side of the various boxes, the catches into which the latch fits, and the arrangement for sustaining the box. The latter, it will be seen from fig. 30, has a pin projecting from its centre, which plays in a corresponding socket attached to the standard.

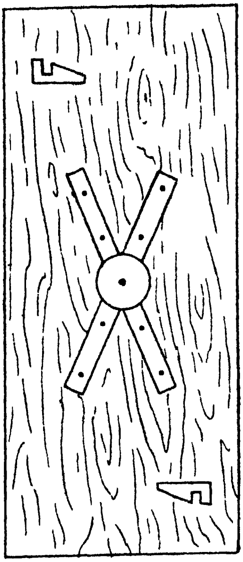

Fig. 31.—*Revolving shelves for cheese—showing fittings at end of boxes.*

It is evident that the breadth of the shelves, as well as the distance at which they are kept apart, are entirely governed by the size of the cheeses that are to be ripened in the room. The various details indicated on the above figures are on the same lines as those in the cheese-room at Kilmarnock Dairy School. The shelves are 14½ inches in breadth, 1¼ inch thick, and they are placed 16 inches apart. The cheeses made at that institution are about 14 inches in diameter by 14 inches in height. This allows 2 inches between the top of the cheese and the lower side of the shelf immediately above it. The box is 63½ inches in length, inside measurement, and is made to hold twelve cheeses, four to a shelf, consequently there is a clear space of about 2 inches sidewise between each of them.

The nearer the height of the cheese corresponds to the space between the shelves the less risk there will of course be of fracturing or in any way harming the cheese as it slides into its new position as the box is being reversed. The less the difference between the two the quicker will the cheese be arrested by the other shelf, and with the less expenditure of force. It will be gently deposited in its appointed place before it has had time to acquire any degree of momentum from its slide. Sufficient room must however be left for the play of air betwixt the top of the cheese and the shelf above.

The Weak Point in Revolving Shelves.

There is the one weak point just hinted at in this kind of shelving which does not hold good with fixed shelves. Where the shelves are fixed, each time the different cheeses are turned the sides that faced inwards are then brought outwards. The cheeses, in addition to being turned end over head, are being regularly revolved on their vertical axes. In the turning shelves the position of each cheese does not change in this respect. The side that faced outwards continues to do so all through the various reversals of the shelves, unless it happens to be moved by hand when being examined or "paled." This cannot, however, be a very momentous matter. There is only the difference of the two comparatively slender spars, as indicated on figs. 26 and 27, and these, one would think, cannot keep much air from the cheese.

If, however, there is anything in this, the fixed shelves have the advantage. Over and above the fact that the cheeses are constantly turned in the manner mentioned, there is no obstruction to the free circulation of air on the fixed shelves such as the spars referred to, and both faces of the row of shelving may alike be called front, provided, of course, that shelves against the wall and those in double rows are kept out of account. This advantage may easily, however, be counteracted by giving a little turn now and again to each cheese in the respective rows of the various revolving boxes.

Heating the Room.

The heating of the cheese-room is an important matter. It is accomplished in various ways: sometimes by means of an open fireplace; oftener, however, by a stove sitting some distance out from the wall. But better than either of these is the ordinary arrangement of hot-water or steam pipes carried round the room, which is to be met with at the best-managed places. Neither the fireplace nor the stove can be relied upon to heat up the whole air-space of the room equally. Before the air at the further end of the room is heated up to the proper degree, that of the one nearer the fireplace, or immediately surrounding the stove, will be hotter than is necessary. But with the hot-water or steam system of heating the cheese-room none of this irregularity can take place where the piping is laid all round. Each part of the room is bound to receive a similar amount of warmth, therefore none of the cheeses can be receiving more heat than another. The temperature of the room can be kept thoroughly in control. It can be raised on short notice; and it can as easily be raised a degree or two as twenty or thirty, which is a very important matter in this connection. Where steam is available it is simply turned into the pipes whenever it is thought expedient; neither does it take long to heat up the water contained in the saddle-boiler when water in the fluid form is the heat-conveying medium. The boiler is generally built against one of the outside walls of the cheese-room, which arrangement serves to keep the place clear of either ashes or smoke.

A dairy fitted up in accordance with what we have sought to describe will, we think, prove acceptable both to the operator and to the public health officer. Good butter as well as good cheese is, it is often remarked, turned out of places of the rough-and-ready order, which is equivalent to saying it is not the nature of the accommodation but the man or woman in charge that influences the quality of the produce. Were the accommodation better, however, there is every probability that the produce likewise would be better, and that, too, without transgressing any sanitary law. It would be easy to make the various buildings a little more elaborate or costly, but that would be to no good purpose. There are, as we have said before, exceptional cases in which it may be pardonable to spend something extra in the way of artistic effect. But at the ordinary rent-paying farm the line must be drawn somewhere if profit either to tenant or landlord is to be derived. Past the line of economy with efficiency it is not therefore advisable to proceed.

Other Buildings subsidiary to the Dairy.

Under this head we are safe to include the pig-house, the dung-stead or manure-pit, and the "hen-house." The two last are common to the ordinary arable farm and the dairy-farm proper; and to some extent so is the first-mentioned. The "feeding" of pigs is, however, a much more important affair at the dairy-farm than at the other. There is so much by-product at the dairy, in the shape of whey and butter-milk, that falls on the occupier's hands, that he is glad to have recourse to the pigs as consumers in the absence of ready-money customers.

The Pig-house.

The old-fashioned pig-house or pig-sty, consisting of a kennel-like inner house and a small outer courtyard, is now at a discount in the dairying districts. The dairy-farmer, or the "bower," prefers to have the pigs housed in a place that is completely covered over. If you ask him why, he will advance sound reasons for his preference. Where the open court is an institution the pigs, during bright weather, he will tell you, are fond of basking in the sunshine, and at times when that is powerful get sunburnt and put off thriving. It is astonishing to see how sore the skin of a pig so situated becomes. Had it the opportunity of its distant relative the brood sow, of the stamp occasionally to be seen wandering about at liberty on the arable farm, to roll itself in some puddle-hole until thickly coated with mud, it might safely defy the sun to glow its strongest. Deprived, however, of its freedom, and so hindered from having recourse to such pleasant preventives, the housed animal is thin-skinned and comparatively clean, and in consequence its hide is unseasoned and it suffers accordingly. Cold boisterous weather, on the other hand, it is equally unfitted, he says, to withstand. And the kind of house we are referring to gives it but poor shelter at a time when sleety winds are making themselves felt.

Fig. 32 gives the plan of a good arrangement of covered pig-houses. Each division measures 12 feet long by 9 feet wide. Seven animals can be housed and finished off in each division. The troughs, it will be noticed, are arranged for that number.

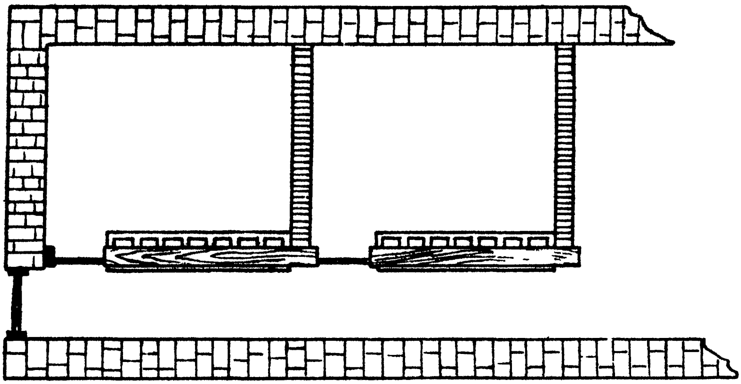

Fig. 32.—*Plan of covered pig-houses—at level of the cope of the divisions.*

Capital fireclay glazed troughs are now manufactured for fitting into houses of this kind. They are made with cross divisions, which have the effect of keeping each pig to its own part of the trough. These divisions do not, as fig. 33 makes plain, go to the bottom of the trough, thus making sure that so long as anything remains in the dish each animal gets an equal chance to make away with it. The bully cannot get in all-fours and keep the others out until he is satisfied. The walk or passage in front of the troughs is shown 3 feet wide.

Fig. 34 depicts the elevation of the troughs and doors. This gives an idea of the simplicity of the arrangement, and how well adapted it is for enabling the attendant to quickly feed the pigs. All she has got to do is to pour the contents of her pails down the inside of the sloping back of the respective troughs and pass on. The object is obtained without moving a bolt or opening slide or door. Two iron rods stretched across above the troughs between these and the wall-plate serve to confine the animals completely. They can gaze at us and we at them, but out they cannot get unless by the open door. The door-jambs may be either of wood or of stone—the latter by preference for the sake of endurance. At the brick-finished side of the door opening the hinge "batts" may in fact be built into the brickwork, and thus save any intervening medium.

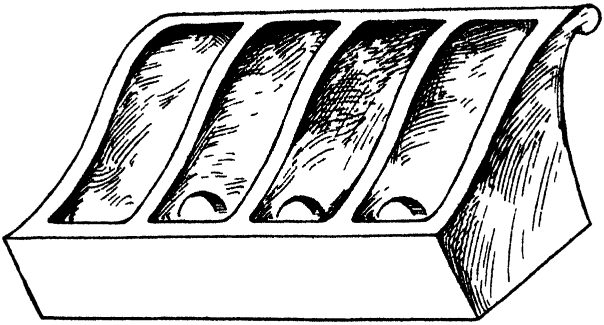

Fig 33 —*Improved pig-house trough.*

The division walls are of 9-inch brickwork, coped with bricks on edge. The floor may be either of glazed paving-brick, bedded either in fine ashes or on sand and grouted with cement, or of Portland cement concrete. We would prefer the latter. It is advisable to give it a hang towards the troughs, and make provision for fluid matter passing through beneath these into an open channel leading down the side of the "walk" or out at the side of the door into the gutter. The back part of the floor is occasionally raised above the portion near to the troughs, leaving enough of room alongside these for the animals to have free access to their food. The object is to ensure the pigs having a dry bed to slumber upon. This precaution is generally worth the trouble. Dairy-fed pigs, on account of the nature of their

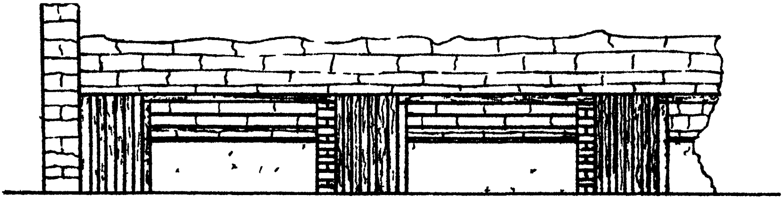

Fig 34 —*Elevation of doors and troughs to passage.*

food, usually dispense much moisture about, what with spillings and voidings. In fig. 35 we give a cross-section of the house. The house may be any length, in accordance with the number of pigs to be kept at the farm and the consequent number of divisions likely to be required in the pig-house. An extra division is not very costly, and need hardly be grudged. It will rarely be empty. It is no uncommon sight at the West Country farmsteading to see during the spring months one or more of the pig-house divisions occupied by calves. They do not seem much out of place there either. Very little alteration, indeed, would make a division of the kind we are describing into an almost ideal calf "pen." They seem to be more comfortable in these, as they are, where there is both light and air, than in the usual dark and stuffy corners in which they are hidden away. On this account we would make provision that the division at each end of the house had a door leading directly into it through the gable. This would enable the calves to be taken out or in without having to be driven along the passage of the house.

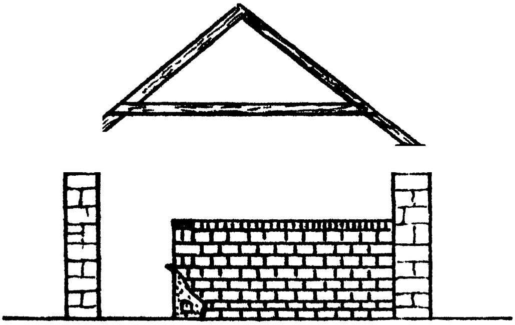

Fig. 35.—*Section of ridge-roofed pig-house.*

It is a good plan, where it can be managed, to make one of the walls of the dung-stead serve as the back wall of the pig-house. When this is done, and an opening made in the wall of each division whereby the soiled litter and excrement can be pitched directly into the midden, much labour is saved. This opening requires, of course, some kind of shutter or door.

The roof of the pig-house may either be of the nature of a ridge roof as in fig. 35, or one after the style of fig. 36, just as circumstances dictate. The building is not so wide but what the single slope of the lean-to or pent roof is too severe a strain on the lower wall. If, however, it be considered so, it is easy to strengthen the framework by means of a runner supported by struts bearing on the brick walls that divide the house.

We would have the house well lighted by means of hinged skylights, which could be used on occasion to augment the supply of fresh air. And in order to maintain a circulation of the latter at all times, we would have a due number of the zinc ventilators previously referred to fitted up.

Referring to fig. 35, the only woodwork that is shown in the construction of the parts that divide the house is in the doors and the front cope or lintel, and there is nothing whatever to hinder the last-mentioned being substituted of another rod of iron similar to those already shown. It would require to be a little heavier perhaps—that need be all the difference. Cast-iron piping would do. One outer door ought to be sufficient to serve the pig-house as a whole — placed at the end most convenient to the cooking-shed and meal-store.

It effects a considerable saving in labour when it is practicable to run the whey by gravitation direct from the vat-room to the neighbourhood of the pig-house. The plan given in fig. 22 admits of this, because the pig-house is placed thereon at the lower end of the byre, and therefore below the level of the vat-room floor. Three-inch glazed fireclay spigot-and-faucet pipes answer well enough if laid thoroughly water-tight and in a regular gradient. The inlet to this pipe should be placed outside the house, a hole being formed in the wall to allow of a communication by means of a movable conductor or pipe between the inlet of the drain and the draw-off valve of the vat. At the farther end the fireclay pipe can be made to empty freely into a sunk well or tank capable of holding a fair supply of whey. The tank should be built of brick and cement in order to be water-tight, and be fitted with a hinged lid. It is easier to scoop up the whey as desired out of a place of this kind, adjacent to the pig-house door, than to carry it in pails all the way from the vat-room. Besides, it has to be stored somewhere, the pigs being served with it two or three times a-day, and not all at

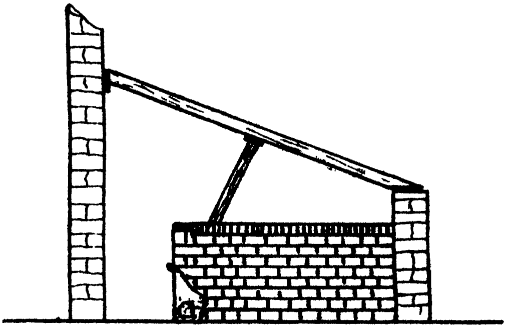

Fig 36 —*Section of lean to roofed pig-house.*

once as each day's supply is forthcoming, and the farther away from the dairy it is kept the better, perhaps. A small pump is sometimes used to lift it from the tank.

The Pig-house epitomised.

In it the animals are sheltered from the severe cold, the wet piercing winds of winter, and the no less trying withering east winds of spring; and shaded from the sun's rays when these are strong enough to scorch their skins. There each can enjoy a dry bed in a well-lighted and sufficiently aired house, and can partake of its food with a minimum of struggling and pressing for the same.

As regards the owner of the animals, his charges are placed under favourable conditions for paying him to their utmost for bed and board. Their health is ensured in so far as ordinary ailments are concerned, and they can be attended to at a very small outlay of labour.

And coming to the owner of the pig-house, he possesses a building that has cost comparatively little to erect, is thoroughly effective for its purpose, and is endurable, requiring but little repair.

Where it is customary to breed pigs at the steading, a combined lying-in hospital and nursery is necessary, but this should be separate from the pig-house proper. Some cosy corner of the steading it is not difficult to find available for such a purpose.

The Dung-stead or Midden.

This necessary adjunct of the homestead, whether of the ordinary arable or the dairy farm, it is always advisable to confine within walls of some kind or another. These need be no higher than is necessary to keep the stuff well together and prevent the place being turned into a thoroughfare. Keeping its contents within bounds in this way prevents their waste, and also promotes tidiness. The dairy-farm midden may profitably be roofed over. The dung produced by a number of cows unprovided with litter is never of the dry sapless nature of that turned out where the straw is so abundant at the farm that it can hardly be converted into manure, therefore it can safely dispense with any additional moisture in the form of rainfall. In fact a large water-tight tank into which to lead the superfluous moisture of the midden is almost an essential at the dairy-farm; and into that it is good management to direct the drains which serve the byre "grips."

When, in addition to the tank, the dung-stead is provided with a roof, the stuff it holds is then under the best conditions *for becoming a valuable fertiliser. It is then prevented from growing wetter than it was when it was thrown therein; and* should it at any time show capability of absorbing more moisture, nothing is more suitable for the purpose than the fluid stored in the tank.

A capital kind of roof for the midden-stead is the "open board" one. It is simple, light, and inexpensive, and fairly endurable. It is put together with ordinary 9″ × $\frac{5}{8}$″ sarking or roofing boards (the kind we fasten the slates to on common roofs), on a light roofing framework of principal rafters and purlins, as depicted on fig. 37. Fig. 38 shows how these boards are arranged on the skeleton of the roof; while fig. 39,

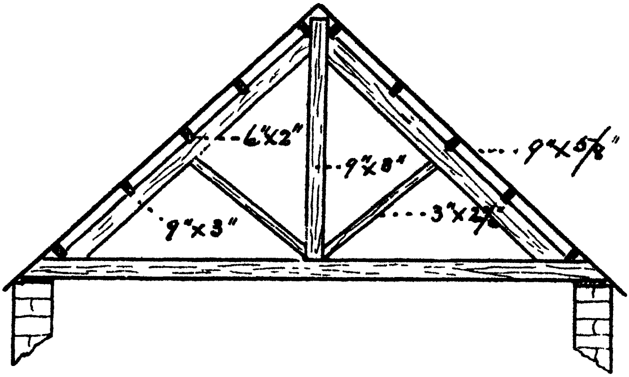

Fig. 37.—*Truss, or "principal couple," for open board roof*

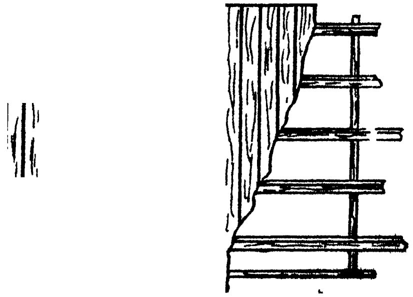

Fig. 38.—*Position of boards on purlins.*

which is on a larger scale, shows the manner of their attachment thereto, and is, indeed, the key to the whole affair.

The peculiar feature of this kind of roof is that the covering boards neither touch each other nor do they bear directly on the purlins. There is a space of about $\frac{1}{8}$ of an inch between the boards, and all of them bear on the heads of galvanised studs (ordinary hobnails or "tackets" answer admirably) driven into the purlins that support them—three being allowed to the breadth of the board, and four wire nails for securing it to the purlin; or it may be four tackets and three wire nails. Thus every one of the covering boards is open to the air all round, and completely isolated from contact with other wood. At no part of it can water lodge and eventually lead to decay. All of them are fixed in mid-air, and there held under the ideal circumstances supposed to be conducive to the thorough seasoning of wood. Referring to fig. 39, *a* represents one of the purlins; *b* the respective boards embraced in the cut; *c* the galvanised tackets intervening betwixt purlin and board; and *d* the wire nails holding the boards in position.

Very little moisture finds its way through the narrow space *e* between the boards. The rain-drops that are falling direct for the slit seem to be deflected to one side or the other of the opening by the attractive force of the boards on either side. These draw the rain down upon themselves and convey it at once to the eaves To prevent the water that is being led down the boards from spreading sideways over the same, and thence into the open spaces, the small side groove *f* is run near to each margin of the several boards. It is advisable also to plane the exposed surface of the boards.

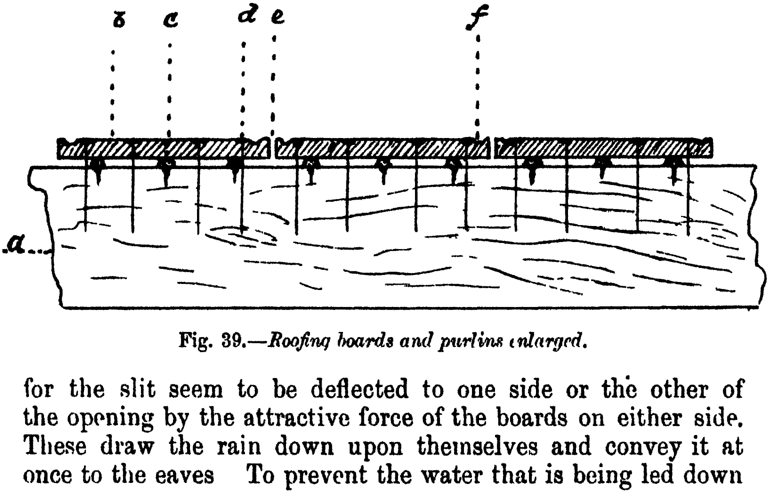

Fig. 39.—*Roofing boards and purlins enlarged.*

Cast-iron rhones, hung on galvanised-iron hooks, are a necessary addition to the eaves.

It is not advisable to cover over too wide a space in a single span. Beyond a certain length of roofing-board it is impossible to keep the rain from spreading over it before the foot is reached. The longer the board, the more rain will be discharged by it into the rhone; and at the part where there is most water on its surface there will it have the greatest difficulty to hold it against wind and other adverse forces that tend to lead it from the right way. A 25-foot span ought, perhaps, to be the maximum one. When two or more spans are had recourse to, one or more centre gutters are needed, and of course pillars of some kind to support the wall-plates. Cast-iron gutters are very suitable, and a 14-inch brick pier, with rounded corners, makes a good support. An inclination of 40° at the wall-head makes a satisfactory slope of roof. It is evident that, in a case of this kind, either too quick or too slow a waterway is to be avoided. In the one instance the flow may become too impetuous to stick to its own board all the way down, and in the other the direct road may have fewer attractions than the by-paths

The Poultry-house.

Our feathered friends are generally the most unsuitably housed of all the live stock of the farm. Too often, indeed, the farmer does not rank them in that category, considering it beneath his dignity to pay attention to such insignificant hangers-on of the steading, and leaving them to be looked after by the women-folk. Nowhere can they be kept at less expense than about the farm-buildings. If they cannot there pick up a complete living on their own account, they at least are able to supplement their share of food from the kitchen or granary with sundry acceptable pickings which would be otherwise lost. When almost left to themselves they seem to be a source of profit at the farm. It therefore needs very little arguing to bear out the assertion that increased care and attention towards the poultry are bound to be well recompensed. Were the farmer to do nothing further in their interest than take care that change of blood was often enough introduced among the poultry, and that good varieties were kept in stock, he would soon reap the benefit either directly or indirectly—either in the form of more toothsome and tenderer fowls served at his own table, or in a greater variety of other table delicacies resulting from increased profit out of the poultry-yard. He might also, without loss of dignity, see that the birds had a decent lodging provided for them.

As a rule the hen-house shelters hens, turkeys, and ducks—if it be on the ground-floor, that is to say. When the hens have to go upstairs in the evenings, the ducks cannot follow, and the turkeys prefer to go higher—to the tree-tops, if left to themselves. Of the "hen-laft" we made mention when treating of the cowhouse. The farmer should, at any rate, take care that neither his women-folk, his cows, nor the hens are put to the inconvenience and discomfort, not to speak of risks to health, associated with a poultry-house of this nature.

The hen-house need not be of a very assuming description. If a high wall is available, it may be built against the same to a plan something after that of the section given in fig. 40. If it must stand separate, fig. 41 shows a suitable section. The building in either case must be as long as the circumstances of the farm necessitate. Parts of it can be partitioned off, each with a separate door to the outside, for ducks, for clockers on eggs, and for clockers bringing up chickens, respectively. Neither of these three divisions need be very large, so that the cost of the whole is not a very big item relatively to that of the steading as a whole. The divisions connected with hatching and rearing require subdividing, and, in addition, some netted outside enclosures—matters which depend on the special circumstances of each case. The ducks, as we all know, prefer to pay their tribute irrespective of nests, neither, for a good reason, are they above sleeping on the floor, hence their nightly "refuge"

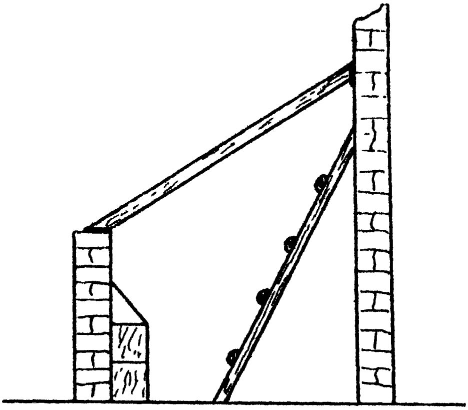

Fig. 40.—*Section of lean-to hen-house.*

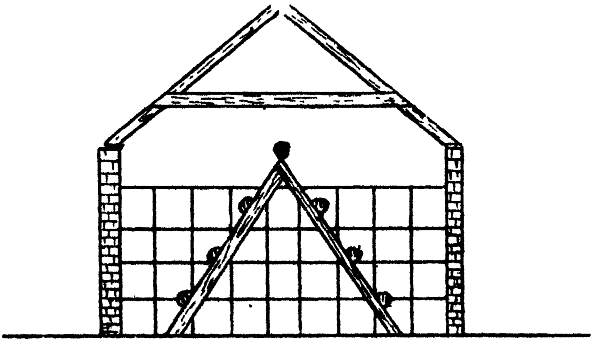

Fig. 41.—*Section of ridge-roofed hen-house.*

is utterly devoid of fittings. We would fain here suggest a compartment or two for turkey-raising, but our humble hen-house is already a goodly row. If, however, the laird sees to the housing of the hens and ducks, the tenant is not ill off if he is left to do that for the turkeys and geese.

The poultry-house, unless it be rat-proof, is very inefficient. Towards that end the Portland cement concrete floor comes here once more to the front. Its other good qualities, especially those of inabsorbency and of being easily cleansed, also render it a most suitable one in this erection.

The walls we would advise to be of brick or of stone, accordingly as the one or the other is most readily attainable. We would have no window openings in the walls. The wall-heads we would cause to be beam-filled.

We would prefer it lighted from the roof by means of hinged skylights, and would take care that a sufficient number of zinc ventilators, as already described, were fitted up on the roof.

If the section of the building selected were that given in fig. 41, it would be necessary to affix wire-netting along the whole length of the building to the undersides of the ties, otherwise the roosters would occupy these to them desirable perches before the proper ones.

In fig. 40 the perches are fixed to supports leaning against the back wall, while along the front wall are arranged two rows of nests. In fig. 41 the perches are shown attached to a triangle placed in the centre of the house; and against the gable is shown a series of nests. The perches are better to be large and flattish rather than thin and round. It is advisable, too, that they be notched into the supports, or otherwise be made easily movable, so as to offer no obstruction to the cleaning out of the house.

The top row of nests should have a sloping cover, as in fig. 40, else the birds will sit there and keep the boards in a mess.

And to further checkmate the rats, zinc may profitably be nailed to the bottom of each door and its stiles for 12 or 15 inches up the front.

With this simple sort of accommodation for the poultry the great majority of farmers' wives would be very pleased indeed. It may come short of the fancier's views on this head; but for one of the ordinary run of farms better off in this respect, there are fifty not nearly so well supplied.

These, then, pretty well exhaust the housing at the farm embraced under the head of "Dairy Buildings."

The byre for the young cattle and the calf-house we have not dealt with. The first-mentioned is but a repetition of the cow-byre on a smaller scale, sized to meet the requirements of the class of cattle likely to be tied up therein; and the best calf-house is some well-lighted, dry, warm, yet airy shed not far from the home sources of supply of the necessary milk, meal, gruel, and cake. The food-cooking shed and the cake and meal store speak for themselves in their naked simplicity.

STATE MODEL FOREST FOR SCOTLAND.

MANAGEMENT SCHEME FOR THE RAITH WOODS.

By Colonel **BAILEY**, Lecturer on Forestry, Edinburgh University.

THE economic value of woodlands in Scotland has not hitherto received the amount of public attention it unquestionably merits. The area at present devoted to the growing of trees forms but an insignificant fraction of that of the uncultivated lands suitable for planting; and we have repeatedly been told by eminent experts of both the French and the German schools of forestry that the class of timber we grow is far inferior to that which a reformed system of management would yield us.

The causes of our national deficiencies in this respect are well known. The first is, that as abundance of imported timber is everywhere purchasable at low rates, we are independent of home-grown supplies; and the second is, that our woods, which are all under private ownership, are, generally speaking, maintained rather as game-preserves and to add to the amenity of the estates of which they form part, than for the sake of the direct revenue which might be derived from them.

So largely, indeed, have considerations other than that of profit guided us in the management of our woodlands, that a widespread doubt exists as to whether our conditions of soil and climate admit of economic forestry being successfully practised here; yet there is no doubt whatever that if landed proprietors would set aside a portion, at any rate, of their woods for management under methods that have been successfully followed in other countries where the conditions are very similar to our own, and if in these areas sylvicultural requirements were allowed to prevail, the returns would be at least as high as those obtained from woods in France and Germany.

M. Boppe, until recently Director of the French National Forest School at Nancy, who paid us an official visit in 1881, on the invitation of the India Office, was struck by the remarkable timber-producing capacity of our soil and climate, and his opinion is confirmed by other experts. Yet our yield of wood to the acre is extremely low, while the quality of our produce, especially of our pine and fir wood, is indisputably very inferior to that of the timber we import from abroad. The superiority of the latter is, indeed, so well known and recognised, that restrictions are placed by Government on the use of home-grown timber for the erection of buildings under the Land Improvement Act; the Postmaster-General cannot be induced to use it for his telegraph-posts; and the Fife miners annually consume nearly a million and a half cubic feet of pit-wood obtained from abroad, in preference to using locally grown wood which they could obtain at a much smaller price. Further proof of the comparatively inferior quality of our pine and fir timber cannot be needed.

Foreign Supplies of Timber not to be relied on.

Then, again, the conditions prevailing in the countries from which we draw the greater part of our supplies, valued at some £18,000,000 annually, indicate that they cannot sustain their present rate of export, which has increased by 11 per cent during the last eight years; and it is certain that before long this will tell on both the quality and the quantity of our imports, and will result in a rise of prices of which we ought to be in a position to take advantage.

If the prospect in regard to the importation of foreign timber were fully realised, and the capacity of our non-agricultural land to grow profitable forests were better understood, proprietors who are in a position to improve their estates would doubtless be ready enough to plant up a considerable portion of the vast area which at present lies waste or yields a meagre revenue from shooting or grazing rents.

Extension of our Wooded Area.

The official returns show that our woods cover little more than 900,000 acres, while about 13,750,000 acres are unemployed or used as rough grazing-grounds. It is true that the whole of this vast area could not be profitably afforested, while it is equally certain that grazing-grounds are needed, and that deer and grouse shooting will not be abandoned. But it is a well-known fact that land of poor quality, wholly incapable of producing a paying crop of corn or roots, can be made to yield pine and fir timber of excellent quality and in remunerative quantity; and there is no doubt that, without undue interference with farming or with sport, large extensions of the existing woodlands might be effected, which would constitute a very safe and profitable form of investment.

The more important of such extensions would no doubt be carried out in the Highlands, where they would have an important bearing on the labour question. Dr Schlich, in his 'Manual of Forestry,' gives some interesting facts regarding the employment of labour in connection with forestry in Germany. He says that about 200,000 families, representing 1,000,000 people, earn £8,000,000 by working in the forests; about 600,000 families, representing 3,000,000 people, gain employment, which brings them in £30,000,000 a-year, in the working up of raw forest produce; and the transport of timber, with other woodland products, costs £4,000,000 a-year. About 12 per cent of the German population are employed in work of the above nature, and they earn over £42,000,000 a-year.

Germany has, however, about 26 per cent of its total area under forest, while in Great Britain and Ireland the proportion is only 4 per cent; and considerable extensions would unquestionably open out a much-needed field of employment for our rural population. But until it can be proved to the satisfaction of landowners that they can safely and profitably invest their money in the manner suggested, they cannot be expected to undertake planting on an extensive scale.

Most countries of continental Europe possess large State forests, where the results of scientific sylviculture can be studied, and which serve as models to guide the management of private estates. This advantage is unfortunately denied to us; and as we have not, throughout the length and breadth of our country, any woods that have been systematically managed on strictly economic principles during a sufficiently long period to show what such management results in, we have come to believe that our own system, which is no doubt a very creditable attempt to combine forestry with sport, and to have regard the while to the effect upon the landscape, is the only one applicable to our natural conditions, and that our woods, too often only half stocked with rough trees, will not produce anything better.

It is unlikely that, for the present at any rate, the State will become the proprietor of extensive forests in Scotland. State forests could not be constituted otherwise than by purchase, and this is not the way in which the great State forest domains of France and Germany were acquired. They are formed for the most part from the remnants of much more extensive hunting-grounds and other lands which have belonged to the Crown from ancient times.

A State Model Forest.

But the State might most reasonably be asked to purchase and maintain a forest of a few thousand acres, which would offer a much-needed object-lesson in economic forestry, would serve as a station of experiment and research, and would at the same time form a practical training-ground for students of forestry, of whom there have for several years past been a considerable number in Edinburgh at the University and other institutions. It must be evident that effective training in a science of this kind cannot be secured by mere classroom teaching, which, though undeniably essential, must be supplemented by practical illustration in woods managed on the right lines; and on this account, and in view of the importance of promoting an early extension of our forest area, the sooner we set about the formation of a model forest the better. The work to be immediately undertaken in any forest which the State might purchase would prove very instructive to students, and valuable lessons regarding the systems of forest management best suited to this country would be gained within a few years of its acquirement. If such a forest did not pay its way from the very beginning, it would certainly do so when in full working order.

No private estate would fully answer our purpose, as we could never be sure that the system introduced would be continuously followed by successive owners throughout the life of even a single crop of trees. Security in this respect cannot be guaranteed otherwise than on State property, where alone the management is free from the uncertainties inseparable from private ownership. Hence we urge the necessity for a State Model Forest; and though the Government does not at present see its way to purchasing a suitable area, we may reasonably hope that, in view of the great national importance of the forest question in Scotland, the day is not far distant when such a forest will be provided.

A Working Plan for Raith.

In the meantime, however, 800 acres of woods at Raith have been put under a regular system of management, which has been laid down in a "working plan," and these woods are freely available for the use of the classes conducted in Edinburgh. Here at last, methods which, though successfully employed in other countries, have been considered inapplicable to our conditions, will at once be put to a practical test; and in the course of a few years many disputed questions will be finally answered.

This is without doubt the most important step yet taken in connection with forestry in this country; but valuable as the advantages thus secured unquestionably are, it is clear that, for the reasons above given, they do not obviate the necessity for a State model forest, the duty of establishing which we must continue to urge on the Government.

Forest management, if it is to be successful, must be conducted on business principles; and in view of the number of years that must elapse between the planting of a wood and the time when it is ripe for the axe, even when timber of comparatively small size is to be grown, continuity of aim and persistent action towards its attainment cannot be maintained throughout the life of the crop of trees unless all work be regulated by a plan or scheme setting forth the objects of management, and indicating at least the broad outlines of the measures necessary to its realisation. In the absence of such a plan it is inevitable that each successive owner or manager will act from time to time as seems good in his own eyes; and in so doing he is sure to depart more or less from the line followed by his predecessors. The result is haphazard work, with frequent changes, which have a most prejudicial effect on the crop; and woods thus unsystematically treated are, after the lapse of forty or fifty years, commonly found to be poorly stocked, incapable of satisfactory improvement, and adding but little to their value by the growth of successive years.

Such woods do not occupy the land profitably. It is manifestly in the interest of the owner that the ground which he devotes to the production of timber grown for profit should be kept fully stocked, and be made to yield up to its full capacity; for there is then less necessity to restrict the areas he desires to treat as game-coverts or as ornamental woods. Moreover, in proportion to the value of the produce they yield, fully-stocked woods are more cheaply fenced, worked, and controlled than woods of less density occupying a larger area; while at the same time the quality of the timber is greatly superior.

It is with a view to gain the advantages and avoid the drawbacks above indicated that a working plan is a necessity for all forests to be managed for profit. In the absence of a scheme based on the purpose to which the produce is to be applied, the amount and condition of the growing stock, and the yield-capacity of the soil, it is impossible for the proprietor to know whether he is taking off the property more or less than the amount to which he is entitled.

On the one hand—and such cases are common—he may refrain from legitimate cutting through fear of taking too much; and on the other hand, acting in the most perfect good faith, he may reduce the growing stock to a point much below that at which it ought to stand.

Then, again, the organisation of woods, with an approximately equal annual out-turn of well-known classes of produce, has a most favourable effect on the local market, and renders possible the foundation in the neighbourhood of industrial undertakings connected with forest produce which an uncertain supply of the raw material on which they depend would not encourage. Lastly, every one concerned with the forests on the estate knows what is to be done,—arrangements for work and for the sale of timber can be made in advance, the workmen are more regularly employed, and mechanical means for transport can be effectively organised, with the result that work in all branches is better and more cheaply performed, and the profits are much enhanced.

It may be added that the owner is likely to take a more lively interest in his woods if they are worked on a settled plan which he can understand and see carried out, and if he is satisfied that they are yielding the maximum revenue derivable from the soil, than if they are managed in a casual, haphazard fashion, and render uncertain returns.

The Nature of the Scheme.

The Raith working plan records the geological and climatic conditions of the estate, describes the woods included in the scheme, and the nature of the injuries to which the stock is most liable; it deals with the market for the produce, showing that 95 per cent of the 1,500,000 cubic feet of pit-wood now annually purchased for use in the coal-mines of Fife is imported from abroad, and is paid for at the pit's mouth at an average rate of 8d. per cubic foot. In view of these facts, the working circle is to be devoted to the growth of this class of produce; and as its estimated minimum yearly out-turn of 60,000 cubic feet forms an insignificant fraction of the amount of timber locally required, the market is fully assured.

The trees are to be cut at the age of forty years; but should indications of a decrease in the consumption of pit-wood appear, they can be allowed to grow on to produce larger-sized timber, for which there will always be an ample demand in the country. The annual fellings for the next twenty years are detailed in the plan, and instructions are given for replanting and thinning.

The expected financial results are also stated. It is estimated that after due allowance for outlay of all kinds, and making a liberal deduction for unforeseen contingencies, the younger woods will, at the age of forty years, yield a net annual surplus of at least 30s. an acre, as compared with a little over 9s. an acre in the case of the older woods. Land of this class, if not afforested, would not yield an average surplus, or clear rental, of more than 4s. per acre. At Raith, however, the market for forest produce is exceptionally favourable, as there is a practically unlimited demand for pit-wood at comparatively high prices, and all refuse wood is saleable as fuel.

A form is suggested for the record of each year's work with its cost, and of the revenue derived from sales; so that the proprietor may be able at any time to satisfy himself as to the extent to which the provisions of the plan are adhered to, and as to the financial results of the management.

It is not unreasonable to hope that the preparation of this plan, the first to be introduced in Scotland, will have a good influence on forest management in the country. It may be added that Mr Munro Ferguson has already commenced a similar working plan for his Novar woods.

THE PAST AND FUTURE OF SCOTTISH AGRICULTURE.

By ANDREW HUTCHESON of Beechwood, Perth.

DURING the last fifty years agriculture in Scotland has passed through many vicissitudes, and great indeed is the wonder that those engaged in the pursuit have managed to survive the changes they have seen. Certainly many good men and true have fallen in the struggle through no fault on their part, while others have had their capital seriously depleted. A few only have come out of the struggle holding their own. It has to be said, however, that most of our Scottish landlords have extended a helping hand to their tenantry during the crisis through which agriculture has passed. Those who insisted on their pound of flesh have been the exception and not the rule. Of course a bargain is a bargain, but those farmers who entered on nineteen-years' leases in the early seventies could hardly weather the storm and pay the rents then promised. Those leasing land now have not the same excuse, as prices for all farm produce are very much reduced, while the labour bill is very much increased, and other expenses are also heavier.

Nineteen-years' leases (and in some cases twenty-one years) were the order of the day in bygone times; but now, in the altered state of things, farmers will hardly risk a long lease without breaks, and it is customary now to take land on shorter tenure than formerly prevailed. A lease is all very well if the rent is moderate and prices remain anything like steady; but the rapid fluctuations in prices and in the demand and supply of commodities have become so great that a nineteen-years' lease is entirely a speculation, and, except under leases entered on within the last few years, the worst of the burden has been borne by the lessee.

There is, however, something to be said in favour of long leases. No doubt it is partly owing to them that agriculture in Scotland attained its pre-eminence,—to long leases and the steadily advancing prices which prevailed in the early part of this century. Those who are confident that prices have touched the bottom are still entering on long leases, but few who have farmed land for the last thirty years would say that prices may not yet reach a still lower level. Shorter tenure has also become more popular since the introduction of the Agricultural Holdings Act, which, although not all that could be wished, recognises the principle of continuous good farming. An amended Agricultural Holdings Act is promised, and eagerly looked for; when it may appear is another question. Landlords have nothing to fear from a properly amended Act, as it is better for them to have their farms well cultivated, and left clean and in good condition, even if they have something to pay for it, than to have them thrown on their hands in a run-out condition. The Act will, of course, also provide for the landlord being protected from the bad farmer, who is a curse to his neighbours as well as to his laird.

In this connection a word of warning may be given to those offering for farms—namely, to note well the condition of the land, its cleanliness, manurial condition, and fertility, and to regulate their offer accordingly. A farm in good order and heart may be worth 10s. an acre more than one equally good as far as the soil is concerned, but which has been badly managed in the past.

Offerers should also remember that rent is but one item, and by no means the heaviest now, in the expenditure of the farm. There used to be a saying that to farm successfully three rents were required—one for the laird, one for expenses, and one for the tenant. This might hold good in the old times, when the rent of land was much higher than it is at present, and the price of produce correspondingly high. Good land which used to let at £2, 10s. per acre would pay at three rents—namely, £7, 10s. per acre. Now that this land has fallen away to 25s. an acre, three rents, or £3, 15s., will never cover the outlays.

Another word of warning to those who are successful offerers for farms is, never to sign a lease before it has been carefully revised both by a practical farmer and by a lawyer. In the opinion of most practical farmers, leases could be very much shortened and simplified to the advantage of all concerned. In these days it does not do to be too severely tied up as regards cropping or as regards the disposal of produce, always providing for the maintenance of the fertility of the soil.

Before we proceed to consider the grain and cattle industries, we must say a word as to the agricultural labourer; and in contrasting his past and present position, certainly the ploughman of to-day has the advantage. He has twice the money wages current forty years ago. He is much more comfortably housed, and owing to the introduction of machinery his work is very much easier at every season of the year. A good man can now command of money wages £1 a-week all the year over, with free house; in some districts £35 a-year, with meal, milk, potatoes, fuel, and free house. His style of living is very much raised from what it used to be in common with all other classes of the community. He has his parliamentary vote as well as his vote for all local boards; and his influence in this way is very much increased. No doubt the rural population has decreased heavily in the last twenty years, owing to the unremunerative state of farming and the laying down of so much of our country to permanent pasture; but when everything is taken into consideration, agricultural labourers are fully as well paid and as comfortable in every way as our artisans.

Grain-growing.

The retrospect of the grain-growing industry may give the older class of farmers some consolation, but the present state of matters and the prospect do not appear rosy. In the good old times when wheat was selling at 50s. to 70s. per quarter, barley from 40s. to 50s., and oats 30s. and above, something could be made at the business, even when paying a good rent for the land; but with wheat at 25s., barley 22s. to 26s., and oats 17s. to £1 per quarter, it is difficult to say what arable land is worth. When you add the labour, manure, and cake bills, interest on capital, &c., to the rent, almost the whole return from the produce is swallowed up. In the past ten years, very often a recourse has had to be made to other sources to supply the deficiency.

In these circumstances it is an interesting inquiry what is to be the future of grain-growing in Great Britain? Of course many answers might be given to this query, and any answer is purely of a speculative character. In regard to the future prices of wheat, it goes without saying that we are never likely to see the prices current twenty to thirty years ago; neither would it be a desirable thing in the interests of the public consumer, nor, we would make bold to say, in the interests of any of the agricultural classes. The high prices of wheat and other grains during the Crimean war led to an inflation of rents which has been, in part at least, the cause of the extreme depression in agriculture that followed. At the same time, when wheat some time ago was selling at £1 a quarter, some pessimists said it would never rise much above that level; while the facts of the case were, that eighteen months or so after these predictions it was sold at 50s. a quarter. Of course we know now that this rapid rise was largely due to unhealthy speculation, but not entirely so; and while we do not believe that wheat will ever be sold at extravagantly high prices, as little do we believe that about £1 a quarter will be the average price for the time to come. At present, while we write (October 1898), wheat is worth from 25s. to 27s. a quarter, and that in the face of reported good crops from most wheat-growing countries.

Now the question comes to be, can wheat be grown at a profit in this country at such prices? The average wheat crop of Scotland will be 4½ quarters per acre—some districts more, some less, some seasons more, some less. Nine bags at 13s. come to £5, 17s., in rough figures £6 per acre. The rent of the land producing the above may be taken at an average of 25s. per imperial acre. Of course we know this is much under the rent of some of the better land of the Lothians, but in these districts the crop will be above the average stated. The crop, therefore, produces four rents, and we think can be grown with a small margin of profit. In many cases also the straw will be sold at from 40s. to 50s. a ton, which will, at 1½ tons per acre, add £3 to the money return, but which, of course, entails the necessity of applying purchased manures to the soil. The conclusion we come to then is, that wheat-growing at 26s. a quarter, while by no means a money-making business, can be carried on in this country without loss.

While of course the wheat-growing farmer feels the competition in the raw material keen enough, that in the manufactured material is keener still. Many argue, and not without good grounds, that unless our American cousins take our potatoes, wool, and oatmeal free of duty into their country, we should shut out their flour altogether, and only take their wheat. Either course would restore prosperity to British agriculture. The former would be the preferable course—free trade all round and no favour. If the latter course were forced upon us, we would still have a cheap and plentiful supply of bread-stuffs, a large employment of home labour, and distribution of wages which is now paid to the American workman.

Barley Crop.

The future of the barley crop is wrapt in mystery. The principal cause of the depression in the price of this grain is the enormous Continental and foreign competition, and the fact that other countries in most seasons grow superior quality, better fitted for the maltsters, than can be grown in our own uncertain climate. Some seasons maltsters will hardly purchase home-grown barley, and a great deal of it finds its way to the distillers at a reduced price. This is not the place to argue the teetotal question, but it may be said without fear of contradiction, that we are not yet within sight of the times when the average Britisher is to give up his beer. In fact, at present everything points the other way, and the boom in the beer and whisky trades is not altogether a healthy sign of the times.

Barley, like wheat, has fallen very much in price during the last twenty years, owing to the causes already stated,—also owing to the many substitutes used in malting, and very much owing to the incidence of the malt tax, the repeal of which, from the grower's point of view, was certainly a great mistake. Some of our barleys find their way to the miller, and are there made into pot-barley; but these are the lower grades, and do not affect the price to any appreciable extent. The demand from the maltsters and brewers is the main factor in the situation, and will no doubt remain so.

Taking the average crop of barley at 5 quarters per imperial acre, and the price at 25s. a quarter, we have £6, 5s. per acre of a gross return, which compares favourably with wheat, only the fodder is not so heavy per acre, nor so valuable, as in the case of wheat.

Oats.

Oats have fallen very much in value, as well as wheat and barley; and while we write, the top quotation in our country markets is about 18s. a quarter. When the boom in wheat was on last season, oats participated in the rise, and were worth at one time about 26s. a quarter; but as far as present appearances go, this price is not likely to be soon reached again.

The main causes of the fall in the price of oats are numerous,—one, of course, being the cheapness of foreign substitutes, especially Indian corn, which can be bought generally at much less per ton than oats. Another reason is, that our working population are using less oatmeal than formerly, and our national diet of oatmeal porridge is falling into disuse. Perhaps this is more noticeable in the working classes in our country than in the middle or upper classes, and it is certainly not a good sign of the times.

Another factor to be reckoned with in the near future in connection with the price of oats and all feeding-stuffs is the changes in motive power. The following is taken from a daily paper, of date 29th September 1898: "Within five years, it is said, there will be, within our cities at least, more motor carriages than vehicles drawn by horses. Within ten years from now, our old friend and ally the horse will doubtless have disappeared from all communities possessing fairly good roads or streets." If this prophecy come true, what will be the future of fodder and feeding-stuffs? Those who remember the beginnings of our railway systems tell us that it was said at that time that horse haulage would be superseded, while the actual fact is that horses are more in demand than ever. However, this change in locomotion—motor cars, cable trams, and electric power—will certainly be formidable rivals to all kinds of horse haulage, and a large part of our oat crop, which at present goes to our stables as food for horses, must find other channels for consumption.

No doubt large quantities of this and other grains will be used as food for cattle and sheep, and will more and more take the place of cakes and artificial foods. One cause why more home-grown grain is not consumed where grown is, that the Agricultural Holdings Act does not allow any compensation for such. In order to get the benefit of this Act a farmer must sell all his own grain and buy his neighbour's. The same state of matters applies to other home-grown stuffs, such as beans and rye.

Hay and Straw.

Our markets for hay and straw are also subject to the same disturbing elements as feeding-stuffs, and if horse-power is to be dispensed with to anything like the extent mentioned in the above extract, almost a revolution is certain in the market for these articles. Hay has for a number of years back been much influenced in price by the large importations of foreign baled hay. Glasgow, and many of our other large cities in the west, are almost wholly supplied with foreign hay, and this competition is sure to continue in the future.

Dairy Farming.

Of all classes of farming, dairy-farming has suffered the least from agricultural depression. Of course this remark does not apply to the same extent to cheese-making districts as to those where milk can be sold as it comes from the cow. The west and south of Scotland is the chief centre of the dairy interest, and large quantities of milk find their way every day all over the country, from Lockerbie, Dumfries, and other parts. Distance is no great object in the way of expense, as our railways carry milk from Lockerbie to Dundee at very little more per gallon than they charge for carrying it, say, a distance of twenty miles.

The dairy industry is a very laborious one, and demands steady and close attention and constant work. In many districts work has to begin about three or four o'clock in the morning, and even earlier at times, as milk must be delivered in the cities about 6 A.M., and sometimes before that.

The whole tendency of our present sanitary laws is against large dairies in the heart of cities and towns, and more and more these centres will have to depend on dairy produce from the country. There is no doubt a wide field for the extension of dairying in Great Britain, as the competition in milk, although present to some extent, is not so acute as in other products. Large quantities of Continental condensed milk find their way to this country, but this can only fill a certain blank. The skilful use of the refrigerator is now working wonders, and there is no saying how far and from what distant countries sweet milk may yet be conveyed.

Butter-making has changed its character entirely since the introduction of the separator, and the taste for sweet-cream butter is now on the increase. Of course there is a large competition in butter from all parts of the world; but this is chiefly the case with powdered and salted butter, and from 1s. to 1s. 4d. per lb. can still be obtained for good home-made fresh butter.

Cheese-making is not nearly so money-making a branch of the dairy industry as it used to be. The competition from America in this class of goods is very severe, and will no doubt continue so. On this account a good many farmers in the west and south of Scotland have altered their system from cheese-making to milk-selling, while others sell milk during the dearer months of the year, and make cheese during the summer months when milk is plentiful and cheap. There does not seem any great prospect of improvement in the cheese-making industry, at least in the near future.

Live Stock.

The breeding and feeding of live stock used to be the sheet-anchor of the British farmer. Unfortunately, within the last few years this source of revenue has begun to fail, and the causes are not far to seek. Foreign store stock have be[illegible] entirely shut out of our markets owing to the risks of disea[illegible] and, without entering into the *pros* and *cons* of this much-vexed question, the result has been a lowering of the price of fat cattle and sheep to such an extent that it is hardly possible to breed and feed ordinary commercial cattle to leave any profit. Had fat cattle been excluded as well as stores, or only admitted in the shape of dead meat, the result would have been different. But all countries are permitted to send fat cattle to Great Britain alive,—of course under the necessity of being slaughtered at port of landing within a certain given time. The result of this arrangement is, that all the foreign cattle formerly coming to this country as stores are now sent in the finished condition, and then the home farmer has to breed and feed an article—namely, fat stock—already in too large supply. In other words, we have a firm embargo on the raw material, while we have an open market for the finished article,—a state of matters no trade can stand. If it is absolutely necessary to shut out all foreign store cattle from this country on account of disease, let this be accompanied by a compulsory foreign dead-meat trade.

To what further extent foreign competition in this line may go it is quite impossible to say, but if it develops as it has done during the past twenty years, and the lowering in value continues, it will be a black look-out for every one connected with the trade. Of course we derive a large portion of our store stock fed in Great Britain from Ireland; and the Board of Agriculture (ostensibly owing to the risk of disease) will not allow fat foreign animals, with compulsory slaughter, to be landed at any port in Ireland. If this permission were granted it would result in a heavy fall in the price of Irish store stock.

Another disturbing element in the live-stock trade is the large amount of arable land laid down to permanent pasture. This has been caused by the unremunerative seasons for grain-growing, and it has been now carried to such an extent that we need more stock in spring to consume our grass than are needed in the autumn to consume turnips and fodder, and in this manner the balance has been destroyed. It is evident that the laying down of arable land to permanent pasture as a cure for agricultural depression has been overdone.

Till within a few years the sheep trade did not feel the foreign competition to the same extent as the cattle trade, but the import of live fat sheep is rapidly on the increase, as also the imports of mutton from the Antipodes.

Another disturbing element—and a very unfair one—is the fact that no distinction is drawn between home and foreign beef and mutton, and both are sold in the same shops and without any law for designating the class of beef or mutton sold. Many think, and not without good cause, that a law should be passed ordering all foreign beef or mutton to be sold as such and in some way distinguished. In the retrospect of the live-stock trade there was no foreign competition; in the prospect there is more and more. Neither does the consumer get the benefit, as he ought to do, of the existing state of matters. The middlemen certainly reap the lion's share of the profits. It is calculated that at present we get 36 per cent of our beef, pork, and mutton from abroad.

Hitherto the breeders of cattle have not felt the effects of the fall in value in fat stock nearly to the same extent as the feeder, but it has now reached them as well. The ultimate end of every meat-producing animal (pedigreed stock excepted) is its value in the shambles, and any fall in price there affects the value of the animal all its life through. Breeders of pedigreed stock have been in the receipt of fairly good prices in the past, owing to the demand for this class of animals from foreign countries wishing to grade up their own herds and flocks; but the quality of these now being so largely improved, it is questionable how long such demand may continue, or even if the tables may not be turned. However, under present laws we cannot import pedigree stock. No doubt the export of so many good animals will improve the quality of the foreign herds, and also intensify the competition in our home markets for fat stock.

The breeding of cattle for purely commercial purposes has extended considerably in the last few years, and under present circumstances seems destined to extend still further. Especially is this the case on the secondary and inferior farms in outlying districts; and while many calves are reared on the pail, a great many are also suckled, and breeding cows and heifers are kept specially for that purpose.

The feeding of cattle is much more a science than it used to be, and early maturity is the object aimed at. Years ago it was rarely that animals under two years old, or two years and a half old, were slaughtered; but now fat cattle at two years old are the order of the day, and even at a less age are to be seen ripe for the butcher. Of course such a practice entails a much larger consumption of bought-in feeding-stuffs; but this pays if judiciously pursued, and not only does it benefit the animals themselves, but nothing will keep up the fertility of the farm like a large consumption of artificial food by stock. Here the farmer of to-day has an advantage over his forefathers in that the prices of foods are very much reduced from what they used to be, certainly from 30 to 40 per cent; and as it was stated before, if more home grain were to be consumed on the holding, we might witness a further fall in these materials.

Another matter in which the present-day farmer has a pull over his ancestors is in the very much improved accommodation at our farm-steadings. As a rule these are up to date, and of course an animal thrives much better and feeds much quicker and comes earlier to maturity in a well-appointed byre or court than it would do in some of the steadings which could be seen in our county districts some years ago, but are now happily the exception.

The selling of stock has also undergone a distinct change within the past thirty years. Then an auction mart was rare, and private dealing prevailed. Now auction marts are as thick as peas, and it is difficult now to get a private bid. Whether this change is beneficial or not, is an open question, but it looks as if it had come to stay. Some have made large fortunes at the trade, while breeders and feeders have been toiling to make ends meet.

The system of selling by live weight is gradually growing in favour, and there is much to be said for it. Of course the spread of this system does not necessarily mean the decay of the live-stock salesmen, as already in some of our marts bids are taken per cwt. Quality, then, is the only matter left to be judged. The growth of this method of sale, especially in the case of fat stock, may lead to the extension again of private dealing. The changes are so rapid in these days, it is impossible to forecast the future with any degree of certainty.

Sheep.

Sheep-farming proper has had a very pleasant retrospect, but the prospect here is clouded. Foreign competition in mutton was longer in developing than in beef; but within the last few years the growth has been very rapid, both in fat sheep alive for compulsory slaughter and in frozen carcass form. From New Zealand and other countries not only can mutton be brought in a frozen state to this country, but it can be kept in that state and thawed at leisure or as the state of the market warrants. Cold storage has now attained a measure of completeness that to our forefathers, and even to ourselves twenty years ago, would have seemed a sheer impossibility.

In many parts of our country sheep-farming is handicapped by the excessive valuation current for sheep stock on farms changing hands. Not only is the full market value placed on stock, but a further sum in name of acclimatisation, and this has run riot. To such an extent is this carried that the rental of sheep-farms is seriously affected, and offerers hardly care to enter the lists at all. From 45s. to 50s. are no uncommon prices for blackfaced ewe and lamb. It is difficult to see how a cure can be got for this state of matters, as a sort of tenant right has sprung up which will be very difficult now to alter. The only seemingly possible way is for the landlord to step in and pay the difference between the market price and the acclimatisation price. If this were done the proprietor would be recouped by greatly enhanced rents. Many proprietors could not, however, stand this strain, and it looks as if the disease were without remedy.

Wool has fallen very much in price in the recollection of the present race of sheep-farmers, and if the price of mutton also is to be permanently lowered, it is difficult to say what sheep-grazing farms may be worth in this country.

The retrospect of the breeding and feeding industries in all the live-stock departments is quite different from what the prospect is. Some hold that the increased population of the world, coupled with the higher scale of living prevalent, will absorb all the available surplus of beef and mutton, while others think there are so many fresh fields in the world for the extension of breeding and feeding that we have not seen the lowest point in prices.

Should the following extract prove correct, the future is not so dark as some are apt to paint it for the live-stock industry in Great Britain:—

CATTLE INDUSTRY OF UNITED STATES AND PROSPECTS OF BRITISH FARMERS.

Mr Hugh O'Beirne, Second Secretary at her Majesty's Embassy at Washington, has sent a report to the Foreign Office which says:—

The total number of cattle in the United States at the opening of the year 1898 is returned by the United States Department of Agriculture at—

Milch cows	15,840,886 head.
Oxen and other cattle . . .	29,264,197 „

These figures represent a decrease of 100,841 milch cows and 1,244,211 "oxen and other cattle" in the course of the previous twelve months. How the country's present stock of cattle compares with that which it has held at different periods during the past ten years is seen from a following table, showing the number of milch cows, oxen, and other cattle on January 1, 1885, and the same date of the years 1892 to 1898 inclusive. Since the commencement of 1892, in which year the number of cattle of the United States was the highest ever attained in the history of the industry, there has been a decrease in "oxen and other cattle" of some 8,387,000 head, or about 22 per cent. The decrease has been continuous since the year 1894, averaging about 1,800,000 head annually; but during the last two years under consideration the rate of diminution has been much less rapid than in the previous two-year period, the loss amounting roughly to 4,523,000 head between January 1894 and January 1896, as against 2,821,000 head from January 1896 to January 1898. It has been a very noticeable feature of the export business that the price of American cattle and beef on the British markets during the year 1897 did not show an improvement, as compared with the previous year, corresponding to that shown by prices of cattle in the United States markets. The average value of fed steers in Chicago for the year 1897 is estimated at about 1s. 10½d. per 100 lb. (live weight) above the average for 1896. The prices of American imported fresh beef per cwt. in the English market for these two years compare thus, according to the British returns:—

1896	£1 17 10
1897	1 18 5

giving an addition per cwt. of only 7d. This estimate (the only one available) of the average of recent prices of American imported beef is based on the "declared values," which are perhaps not altogether reliable; but it is clear from the general course of quotations that the advance in prices of American beef on the English market was at any rate considerably less than the advance in Chicago. The improvement in price of British cattle was also less marked than that in the United States markets; the estimated average price in the London Metropolitan Market being 1s. 2d. per cwt. (estimated dressed weight) higher in 1897 than in 1896. The difference between the English and American prices seems thus to have been scarcely large enough to afford a fair profit on exportation; and the year 1897 is described by the 'Live Stock Report' as a busy but not a very profitable one for exporters. The cost of placing a steer bought in Chicago on the English market is estimated roundly at £5, with some variation from changes in ocean freights, and it is reckoned that in the case of heavy-weight cattle such as are exported, a difference of from 3d. to 3½d. per lb. between the prices in the two markets is about sufficient, allowing for shrinkage in transit, to yield a reasonable profit to the exporter. Of the cattle shipped to England in 1897 about two-thirds were bought in Chicago, at prices ranging from 2d. to 2 7·10d. per lb., largely from 2 3·10d. to 2½d. per lb. The price of American cattle on the Deptford market ranged from 4½d. to 6¼d.; but the top price seldom reached the latter figure, being more generally about 5d. to 5¾d., so that the margin appears frequently to have fallen below the 3d. necessary, according to our estimate, to furnish a profit. In the long-run the export will, of course, continue only at such a difference between the two prices as is sufficient to give a fair profit on the trade; and when the question of the relative prices in the two countries is taken into account, the prospect for British farmers is by no means so disheartening as has been inferred from the increase of the American exportation. The export of cattle and beef to Great Britain has increased; but the price at which they can be profitably brought to the English consumer has not been lowered, and there is no prospect of its being so. The past few years, as we have seen in the course of this report, have brought about a restriction in the American supply which tends for the present to strengthen American prices, and there has been a recovery in the demand, which still continues. The former of these conditions is to be reckoned with for some time to come as the principal factor influencing the American market, though the increasing activity in the breeding business may be expected gradually to correct it. Looking somewhat further ahead, the fact principally to be noticed is that the cost of production of American cattle tends on the whole to increase, as compared with that of British. With the decline of ranching and the substitution of dearer methods of cattle-raising, the average cost of making beef in the United States has for some years been on the increase; and this process is now very noticeable in the south-western region, which is of peculiar importance as the source from which the country has in recent times drawn enormous supplies of cheap cattle. In parts of the West, where ranching has long since disappeared, the cost of cattle-raising also tends to increase slowly as population becomes thicker, and pasture and hay become less abundant and dearer. There is therefore no reason to anticipate, as time goes on, the American stock-grower will find himself in a better position to undersell producers in the older country. On the contrary, the terms on which the two compete tend in the long-run to become less unfavourable to the British farmer.

Minor Industries.

There are a number of minor industries open to the farmer which are perhaps not fully taken advantage of.

Market-gardening, including the growing of fruit, seems capable of extension; and while vegetables can best be grown to profit near large consuming centres, fruit can be railed long distances, and there are so many preserve-factories now that there is usually one within reasonable distance. £30, £40, and even £50 per acre are spoken of as returns for strawberry and raspberry culture. Of course they need a year or two to come to this, and need to be renewed after some years' bearing, still there is money in the occupation.

Then there is *poultry-farming*, still capable of great extension. This country pays an almost fabulous sum, running into millions, for foreign eggs, which might as well be produced at home. Poultry about the ordinary farm, perhaps, do not pay their way, but certainly they do so when made a specialty and properly looked after.

Swine breeding and feeding is also not pursued enough as a science. A properly managed breeding sow is the best paying animal about a farm. Swine in cattle-courts are often against the comfort of the animals feeding, but every farmer ought to have some place where he can keep a few. In some localities, and where certain classes of food are available, it pays well to breed and feed swine in large numbers. Our herds of swine have been decimated by swine-fever during the last few years, and it looks as if the Board of Agriculture were impotent to cope with this malady.

Potatoes.

The growing of potatoes is perhaps the most speculative of all the departments of farming. It certainly is not hopeful in prospect; the prices got in years past and gone seem quite unattainable. Potatoes are perhaps the most expensive of all the farm crops to grow; and while in some years, such as 1897, they may bring in a fair return, the two years before that were miserable in the extreme, and this year's crop seems to be going to add another to the season of lean years in potato-growing.

It is not difficult to see how this state of matters has been brought about, for the Scottish grower at any rate. In the first place, the growing of potatoes in English counties, where formerly it was not thought of, has developed to a large extent in late years. The English growers are nearer the London and other large English markets, the carriage is much less, and the quality good. In former years large quantities went to London and the South which have now perforce to find other markets. Then every year there is a large Continental importation into London and the seaboard towns of England. These are carried by water, and can be handled much cheaper than the Scottish produce, and form a very potent element in keeping down prices.

Then in recent years many new varieties have been introduced, disease-resisting in many cases and very large croppers, and of very good quality, tending to reduce prices. In fact, the potato-grower is far better with a moderate crop and a fair price than a large crop and little for them per ton. Spraying the potato crop to prevent disease is an operation too little practised. It not only prevents disease, but keeps the plant fresh and growing: it is largely practised in the Lothians, in some parts of England, and in many districts of Ireland. If growers would restrict the area devoted to this crop, it would benefit themselves and all concerned; and, of course, if new markets could be found, it would be a great matter.

Some years ago we exported potatoes largely to the American continent, with varying results. We got our American cousins at one time to reduce the duty considerably, but under their new fiscal arrangements it is again raised, and amounts at present to nearly £2 per ton. Add to this the cost of the article on this side, freight, insurance, commission, and risk, and it is easily seen that if a remunerative trade is to be carried on, the price in America must be very high.

Among our home population the idea of the fattening properties of a potato diet is taking firm root, and the esculent is avoided altogether by many at the dinner-table. Taking all the above circumstances into account, the future of the potato-growing industry cannot be said to be hopeful; and no one need offer large rents for suitable potato-growing land in the hope of large prices per ton. They will not generally fall, however, below a certain price, as they come in then for feeding purposes, and it is better to use them for such than to market them at a low figure when all expenses are taken into consideration. They are in many cases an essential part of the rotation, and turnips cannot take their place without danger from finger-and-toe disease. They are also a valuable preparation for the wheat crop, which on most soils thrives better after potatoes than after any other crop.

Conclusion.

To sum up the question of the prospect of agriculture, I would say that in future farming must be pursued under very different conditions from what it has been subject to in the past. The utmost care and economy will have to be practised in all departments. A free hand will have to be given to the cultivator of the soil both as to rotation of cropping and disposal of produce, subject, of course, to the occupier being bound to maintain the fertility of the soil. The home agriculturist must also see that the Government of the day gives him a fair field while he asks no favour. To this end foreign produce of all kinds must be identified and sold as such, under severe penalties for any breach of the law. A thoroughly liberal amended Agricultural Holdings Act must be passed—a measure which, while duly guarding the interests of the owner of the soil, must encourage the tenant to farm well, and to use with due care the largest profitable amount of fertilisers and feeding-stuffs.

Farmers must use all the labour-saving implements possible, and try to produce the best of everything. Railway companies must be got to carry all kinds of agricultural produce at reasonable rates, and not as at present to give an undue preference to the foreigner. The railway companies must also bear a fair share of local taxation, and not escape on any grounds contributing their just and lawful portion of all the public rates. To their credit be it said they have lately revised their rates for small parcels, which is a certain help to the farmer.

The farmer has to contend with many evils that cannot be remedied, such as a fickle climate, foreign competition, and increased expenses of all kinds; but were all unfair and artificial restrictions withdrawn, he would no doubt maintain the character of his forefathers for pluck, enterprise, and success.

AGRICULTURAL CREDIT BANKS.

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Among the numerous ideas which have come before the public for discussion in connection with the amelioration of agricultural depression, perhaps none has been viewed, at first sight, with more distrust than that embodied in the subject on which I have been asked to write. It is not at all surprising that this should be so, for the principle upon which Agricultural Credit Banks are founded and worked does violence to the preconceptions of ordinary men of business in a rather startling way. I propose, as briefly as possible, to show, by an accumulation of testimony, that the idea is not only theoretically defensible when clearly understood, but that its practicability has been demonstrated under so wide a variety of conditions, and upon so large a scale, that it must be conceded to merit the careful consideration of all who are interested in the welfare of the rural population. I ought perhaps to explain that I make no claim to any special knowledge of the subject, beyond such as has been gathered by a personal interest in it during the past few years, and an access to such information as has been published in this country with regard to it.

We, in England at least, are pretty obstinately imbued with the notion that the use of capital is restricted to those who actually possess it, either in cash or tangible security. The "small man," as we say, who has nothing beyond his labour, is practically debarred from the use of capital. Capital, in fact, can at all times hire labour by paying for it, but labour alone cannot hire capital. Most people will say, no doubt, that this is in the nature of things, and unalterable. The interesting, and the novel, point about Agricultural Credit Banks is, that they have controverted this apparent truism, and have shown that it is possible to provide a man possessing absolutely no security, in the commercial sense of the word, with the use of money without greater risk than is incurred on a larger scale by bankers in the ordinary way of business. Let us examine the paradox.

What an Agricultural Credit Bank is.

By way of clearing the issue, it is necessary at the outset to explain what these Agricultural Credit Banks—or, as they are commonly called, Agricultural Banks—are not. Their popular designation cannot be termed a very happy one, for their functions are not necessarily agricultural, and they are not banks in the ordinary meaning of the word. The word "bank" conveys primarily the idea of an establishment at which money is deposited, whereas an agricultural bank is started mainly for the purpose of lending money. Again, the adjective "agricultural" would seem to imply that they were chiefly for the use or assistance of farmers, whereas in fact they are not at all adapted for tenant-farmers as a class. A more truly descriptive appellation would be "Village Co-operative Credit Associations," which, for a short title, fairly indicates their scope.

The name which has commonly stuck to them originated in the fact that on the Continent there are two or three different forms of rural banks or credit associations which, in some cases, supply the want of ordinary banking facilities such as in this country are provided pretty generally by joint-stock and other banks of the ordinary kind. The agricultural class in many parts of the Continent also consists principally of owners or occupiers of small plots of land, who, although of course coming within the general category of agriculturists, do not in this country form what we should term the agricultural class.

Those who wish for information respecting the operations of other kinds of rural banks on the Continent, which are adapted in some cases to the wants of larger farmers, may find full particulars in an interesting work entitled 'People's Banks,' by Mr H. W. Wolff, who has given a very great amount of attention to the whole question.

Raiffeisen System.

Here it will not be necessary to go into particulars except with regard to the only system which has as yet shown itself in any degree adaptable to the circumstances of the United Kingdom. This is known as the Raiffeisen system, the name being that of its original founder.

Herr Raiffeisen was born in Germany in 1818, and in 1848 was appointed Burgomaster of Flammersfeld, on the Rhine, consisting of thirty-three communes with a population, mostly agricultural, of about 5000. Amongst these the usurer was rampant and omnipotent. The distress among the poorer agriculturists claimed the immediate sympathy of Raiffeisen, and the co-operative idea which originated in his brain, and which afterwards developed in the organisation of credit banks, was brought about by the philanthropic desire to benefit the small landowners and to enable them to live without falling into the clutches of the money-lender. Raiffeisen distinctly laid down that speculation in every form was to be excluded from the objects of the society, and insisted firmly on making moral character a qualification of membership.

Briefly, the distinctive features of the Raiffeisen organisation are the insistence on the absolute joint responsibility of all the members—in other words, their unlimited liability—the absence of all paid administrative posts, the exclusion of members' shares and individual profit (although this has to some extent been modified in recent years), and the examination into not only the financial condition and moral character of the borrower, but also into the purpose for which a loan is required and the way in which it is applied.

The Credit Bank in Germany.

From the interesting reports furnished to the Foreign Office by her Majesty's representatives in Vienna, Berlin, and Rome, on the Raiffeisen system of co-operative agricultural credit associations, obtained at the instance of Mr Yerburgh, M.P., in 1895, I summarise an account of the organisation of a local Raiffeisen credit association in Germany, written by Mr Tower of the Berlin Embassy.

Every association forming part of the Central Credit Bank is governed by its General Assembly, its Council of Directors, its Board of Control, and its Accountant. The General Assembly comprises all male members of the Association, as well as representatives of females, and heirs of deceased members, and it meets regularly twice a-year. The Council of Directors is appointed for three years, and consists usually of nine members—viz., the President, Vice-President, and seven others elected by the General Assembly. The Board of Control comprises five members—viz., the Comptroller, Vice-Comptroller, and three others—and is appointed for four years. Members of the "Council" may not at the same time be members of the "Board." The Accountant may not be a member either of the council or the board, but he may be admitted to meetings of the latter body when the question of granting loans is under discussion. He is appointed for four years, but may be removed at three months' notice, and all the cash-keeping and book-keeping are entrusted to him, subject to the Board of Control. Each association frames its own rules, which must, however, accord with the general statutes regulating credit banks.

The Rules.

The more important rules provide, first, that the objects of the association shall be

"To ameliorate in every respect the condition of the members of the association, and with that intent to create the pecuniary means for granting loans to its members on mutual security, and particularly to receive and pay interest upon savings.

"To hold a sum under the name of a 'Foundation Fund for improving the economic condition of the members of the association.'

"Loans may be granted by the association to its members as follows: For a short term up to one year. A prolongation may be given at the request of the debtor, but the limit of two years must not be exceeded. For longer terms, to be paid back in yearly instalments, the term not to exceed ten years.

The Board of Control reserves the right of claiming repayment by giving four weeks' notice.

"Before any loan can be granted inquiries must be instituted whether the borrower is financially and morally worthy of credit, and the intended application of the money is ascertained as far as possible. This application must afterwards be controlled.

"Security must be given for loans granted on current account in order to obviate any risk to the association. This security may consist of a person standing surety, of a mortgage, or of a deposit of safe bonds."

After covering the expenses of administration, two-thirds of the yearly gross surplus are credited to the foundation fund for improving the economic condition of members; 20 per cent of the remaining net profit is put into the reserve fund, and the General Assembly has to determine as to the disposal of the residue. The foundation fund must thus be accumulated until it has reached an amount sufficient as floating capital of the association. The association has complete control over this fund, but the members personally have no share in it, and can claim no division. Even in the case of the dissolution of the association the foundation fund cannot be divided, but is to be paid over intact to the central agricultural credit bank to remain there at compound interest until a new credit bank is started.

For covering losses a reserve fund is accumulated up to £750 from the 20 per cent of the net profit as above mentioned. The reserve fund is considered as the property of the association in the event of dissolution.

The members of the council of directors and the board of control hold office gratuitously, and may claim no more than the reimbursement of their bare expenses. The accountant is paid in proportion to the services required of him, but it must be by a fixed annual sum, and not a share of profits or percentage on receipts.

Mr Tower states: "The fact of all administrative services being gratuitous removes to a great extent the danger to which the members would otherwise be exposed from the system of unlimited liability. Not to speak of the immense gain to the finances of the society through the absence of salaries, the social position of persons willing to assume honorary administrative duties in an organisation from which all speculation is rigidly excluded must of itself be a safeguard to the stability of the undertaking."

The unlimited liability system has, of course, been a bugbear to many, but it is claimed that its satisfactory working for fifty years proves its soundness. Every member of the association must take one share of 10 marks (10s.), but no more. Herr

Raiffeisen was himself strongly opposed to the system of shares, but as co-operative societies under the German law may not be inscribed on the Co-operative Societies' Register unless members' shares are permitted, this modification has been made.

There were in 1896 in Germany no less than 6391 credit societies of various kinds, the majority being on the Raiffeisen system.

The main principles of Raiffeisen's system may be thus summarised: (1) Unlimited liability of members; (2) smallness of area, to secure personal knowledge of all members and supervision of application of loans; (3) grant of loans only for specific and productive purposes; (4) absence of paid administrative posts.

Details might be given to show the enormous ramifications and wide scope of these banks in Germany; this, however, is unnecessary. It need only be said generally that the organisation is now undoubtedly one of the most prominent factors in the rural life of that country.

Credit Banks in Italy.

Turning for a moment to Italy, it is interesting to notice that it appears to have been the first country to apply the principle of co-operative credit to agricultural purposes. The Monti Frumentari, which existed at one time or other in many parts of Italy, have for their object the assistance of small farmers or peasant proprietors in the purchase of seed and cattle by a system of local credit. The most ancient institution of this class is stated to have been founded in 1421 in the province of Sassari, in the island of Sardinia.

It appears that in each parish of the province a field was reserved for the cultivation of grain under the superintendence of the priest, labour being contributed on Sundays by all adult parishioners. The produce of this parochial field formed the capital of the institution, and in case of necessity, any parishioner could obtain a loan, repayable with interest at 4 per cent, in kind, at the next harvest. Surplus reserves of seed were sold from time to time, and the money realised was lent for the purchase of cattle, interest on these cash loans being fixed at 2½ per cent. Under such regulations the funds of many of the Monti Frumentari became in time very considerable, and in excess of the requirements for which they were founded. This prosperity, however, appears to have been the cause of their ultimate collapse, as the control gradually passed into the hands of the richer classes, who had originally nothing to do with them, and loans of large sums were granted without the caution or security provided by the jealous control of the parish priest and his poorer parishioners. Another cause of the dissipation of the funds of the Monti Frumentari was the passing of a law in 1852 authorising the employment of their resources for the construction of roads and other local objects of public utility.

Rural loan banks on the Raiffeisen system were started in Italy by a member of the Italian Parliament, Signor Wollemborg, in 1883, but they appear to have been hitherto tried only in certain districts of Northern Italy.

The following passage from the Foreign Office report, written by Mr Fraser of the Embassy at Rome, summarises very clearly the scope of the banks and their general results:—

"The backbone of this system of rural banks is to be found in their strictly local character, and the fact that the members of each are near neighbours and therefore well acquainted with each other's position; and it is natural that, considering the unlimited liability of the members, community of interest will lead one peasant to help another, as a fellow-member of his loan bank, with a solicitude which mere neighbourly feeling would never have called forth. The area of the society's activity is so restricted that the members learn to know each other's troubles, and to take an interest in them from the point of view of common advancement. The important and direct share in the business of the bank taken by all its members in general assembly, their numerous and detailed privileges and duties of control and decision, not only in electing officers and reviewing their work, but in fixing limits and laying down rules for the latter's guidance, with the right and duty of supervision of every transaction and its results, combine to give the institution its essentially popular character. The general interest that is awakened in each other's welfare has been found to raise reciprocal esteem, to develop individual energy, and to encourage a healthy emulation. Many of these loan-banks have been the means of inciting their members to efforts for the common good, such as the purchase of material at wholesale prices or the hire of agricultural machines; and the discovery of common interests and the encouragement of experiments have had an educating and elevating influence on the peasantry. . . . Usury has almost disappeared from the particular districts where these rural loan-banks have been opened, since the bank serves every purpose for which usurers were formerly called in, and in Italy to so great an extent."

Credit Banks in France.

In France the establishment of agricultural credit banks is quite recent. As Comte de Rocquigny points out in his report on "La Co-operation de Production dans l'Agriculture," in Germany and Italy the organisation of agricultural credit has generally preceded and engendered the application of co-operative methods to agriculture, but in France the process has been reversed. He dates the movement in France from the year 1893, but it has since developed with considerable rapidity in various departments—at first by individual efforts, and subsequently under the wing, so to speak, of the immense organisation of the Syndicats Agricoles.

Credit Banks in Ireland.

From the British point of view, perhaps, more interest attaches to the modest experiments in agricultural credit made in Ireland by the Agricultural Organisation Society than even to the triumphs of the Continental associations. Three banks have been now working for some two or three years past at Doneraile, Kyle, and Belmullet respectively, and within the last twelve months several others have been established. The Irish Agricultural Organisation Society, in its report for the year ending March 31, 1898, stated that the three banks just named met with continued success. The auditor of the Doneraile bank in his report observed: "It is impossible to estimate the advantages of such an institution as yours. They can become apparent only after a time, inasmuch as the transactions, while they are of the greatest consequence to the poor people, are small. Meantime the bank pursues its unambitious and gracious course, removing pressure and difficulties, relieving anxieties, and fostering habits of thrift and industry."

"The bank at Belmullet, which has worked with equal success, has had results of still greater value, for its success has made possible important developments in these poverty-stricken districts which we hope will prove rich with benefit to the people there."

This bank is situated in the congested districts, where, of course, the problem to be solved presents peculiar features. The poverty of those districts rendered it almost a mockery to ask the people to find capital for creameries, or even to co-operate to buy manures, &c. The character also of the people, who in the nature of the case were unfamiliar with business methods, rendered it essential to start a plan which would not only be simple and helpful, but also educational. The Organisation Society considered that the Raiffeisen bank system answered these requirements, and that it could not only be worked successfully in the poorest parishes, but it would also effect the moral regeneration of people who had not previously been dealt with in a way to keep alive the spirit of self-help and independence.

The following passage from the report of the Irish Organisation Society indicates their views on the subject, and puts the position in a very forcible and lucid way:—

"We attach very great importance to the introduction of the Raiffeisen system into Ireland, and are inclined to put it in the forefront of our propaganda. The question of finance lies at the root of every other endeavour of our Organisation, and the joint-stock banks and loan fund societies are so much concerned about dividends for shareholders, that the peculiar requirements of small farmers have been overlooked. The need of a purely humane credit system, sufficiently safeguarded, but established for the benefit of borrowers, has been forced upon us by our knowledge of the extent to which usury prevails. The 60-per-cent philanthropist has been reaping a rich reward for his endeavours to relieve distress; and the extraordinary perversions of any system which seemed to afford the needy borrower an opportunity of obtaining money, no matter on what ruinous conditions, as evidenced by the abuses of the 'trust auctions' in Donegal, convinced us that not only was a new credit system necessary, but also that an attempt to instruct the present generation of farmers in the proper uses of credit ought to be made. At present the small farmer in the congested districts uses whatever credit he can command, mainly to stop a gap or pay off an old debt, and he has not learned to use it for purposes which will enrich him. He has no conception of what a proper rate of interest is. He is unaware that he pays 30 per cent when so many shillings are deducted from a loan or added on to a bill; and with these vague notions engendered by the 'barter' system, where no money is given or received, it is no wonder that at least one-half of his possible income melts in transactions of this kind. . . .

"Only those who know the amazing economics of the small Irish farmer in the West can realise to what an extent the sharpening of his business wits will benefit him and prepare him for further organisation. This sharpening is brought about not only by the unlimited liability, but also by the method of lending. The borrower comes before his committee with his application for a loan, and the likelihood of a profit to be gained or a saving to be effected is threshed out by the members, interested, for their own sakes if for no other reason, in seeing their fellow-member succeed and in preserving him from failure. The borrower's sureties are also bound to see that the money is properly applied as well as repaid. The rate of profit the small farmer in the congested districts can show on loans granted in such a way is very striking. Up to a certain limit, conditioned by the extent of his holding, he can do more with one pound than a richer man with twenty; and that one pound given at the proper time may mean rent and home. A man borrows twenty-four shillings and buys two 'bonhams' in the spring; in the winter he sells them for five pounds ten shillings, pays back his loan and his rent at the same time. With the poorer 'congest' farmer the rent-money raised by the sale of a couple of pigs, or a calf, or a few sheep, is almost the only money he handles. He grows nearly all his own food, and manages to get flour, tea, and sugar in addition, by bartering eggs or some other part of his little produce. In this barter half the value of that little slips away from him. If his cow or his pigs die he is almost helpless. There is no institution he can borrow from, unless the 'gombeen' man trusts him. There are so many like him who are helpless from want of capital, that we are convinced that there is hardly any scheme which is likely to do more good than this of agricultural banks."

The following summary of the financial operations for 1897 of the three banks above referred to—viz., Doneraile in Co. Cork, Kyle in Queen's County, and Belmullet in Co. Mayo—will give a fair indication of the scope of their operations:—

	Doneraile.	Kyle.	Belmullet.
Loan capital . . .	£155	£35	£105
Reserve account . . .	6	35	1
Interest received for loans .	9	3	5
Interest paid on loans . .	6	1	4
Loans granted . . .	268	60	147
Outstanding loans at end of 1897	155	60	68
Net profit	3	2	1
Average size of loan . .	4	5	3
No. of loans granted . .	69	12	43

Credit Banks in England.

We may come still nearer home, and find instances of village credit associations successfully working in England. These have been established as the result of propagandist work done by the Agricultural Banks Association, of which Mr Yerburgh, M.P., is president. In a paper communicated by him to the Manchester Statistical Society in December 1897 details were given, from returns then recently received, of the operations of seven of these banks—viz., at Pembury in Kent, Scawby in Lincolnshire, Wiggenhall in Norfolk, Cottenham in Cambridgeshire, Castlemorten in Worcestershire, Hedge End in Hampshire, and Laxfield in Suffolk. These returns have been concisely tabulated as follow:—

	Pembury, Kent.	Scawby, Lincolnshire	Wiggenhall, Norfolk.	Cottenham, Cambs.	Castlemorten, Worcestershire	Hedge End, Hants.	Laxfield, Suffolk.
1. Date of formation	August 1894	July 1894	May 1896	April 1896	January 1896	February 1896	September 1894
2. No. of members	36	22	49	16	15	24	11
3. Capital . .	£194	£200	£74 ; bankers allow overdraft	£100	£30	£125	£35
4. Composition .	Small tradesmen, artisans, farmers, labourers	Small farmers, tradesmen, and artisans	Labourers and tradesmen	Tradesmen, small farmers, labourers	Allotment-holders	Market-gardeners	Labourers, small holders, shopkeepers
5. Number of loans granted	14	6	20	12	9	19	6
6. Minimum loan .	£4	£20	£3	£1, 10s.	£1, 10s.	£3	£1, 10s.
7. Maximum loan .	£50	£30	£20	£6	£8	£40	£25
8. Purposes of loan	Horses, cows, omnibus, carts, manure, coals, seeds, &c.	Farm live stock, iron	Pigs, allotments, cows, greenhouse	Pony and cart, leather, coals, &c.	Seeds, pigs, calves, manure, sheep	Manures, seeds, pigs, cart, potatoes	Horse, cow, young pigs
9. Most probable purposes in future	Trade and agriculture	As above and for all village industries	Allotments	Stock, implements, seeds, &c.	As above	As above	Live stock, implements, seed, and manure
10. Are instalments repaid punctually?	Yes, with one exception	Yes	Yes	Yes	Yes	Yes	Yes
11. Opinion of usefulness of bank	Most useful, but great care required sifting character of applicants	Proved its utility	Most useful	Most useful	A great help to all who have borrowed	Doing a useful work	It will become very useful

An examination of these details will give a very fair indication of the operations of these banks, but their work may be illustrated by one or two concrete examples. Two cases are cited by the secretary of the Scawby Society:—

"*1. A temporary loan enabled a tradesman to go with the money in his hand to the best firms he knew and purchase material at the lowest cash price, and so undertake a good and safe contract.* He got the contract in competition with outside firms, gave satisfaction, and kept the work in the village. Repaid loan the day before it was actually due.

"2. One small farmer says the bank has been the 'making of him.' He was a labourer, hard-working, clever, and industrious, brought up a very large family, and after getting them all out had a few pounds in hand, but was handicapped for want of a little extra capital for buying sheep for winter. This we lent him, with excellent results."

That a village credit society may lead to further developments is illustrated by the case of the Pembury bank, which is thus referred to in a report by Professor Bottomley, one of the honorary secretaries of the Agricultural Banks Association:—

"The bank has more than fulfilled the anticipations of its founder (Dr Malden), and all the members are enthusiastic about 'their' bank, as they call it. One member says it has given him a 'bus. Formerly he drove a one-horse 'bus for conveying passengers and parcels betweeen Pembury and Tunbridge Wells. This proved so successful that he wished to start a two-horse 'bus, but had not sufficient money to purchase one, and saw no prospect of obtaining any. When the village bank commenced operations he joined and obtained a loan of £30. This, together with the interest, he has repaid at the rate of 30s. per month. And now the 'bus is clear, having paid for itself out of the extra profits. Naturally the owner is delighted with the village bank, and says there ought to be one in every village in England.

"After a year's successful working of the bank a most interesting development took place. Some of the members felt that with the increased facilities provided by the bank for obtaining capital, they could profitably cultivate more land than could be obtained from the village allotments. Therefore eight of them combined together and jointly took a farm of 120 acres on a seven-years' lease from the Marquis of Camden, on the condition that they might subdivide the land as they wished. The largest holding is 40 acres, the smallest 8 acres; and the farmhouse, two cottages, and various farm-buildings have been apportioned as convenient.

"The undertaking has been a great success, and demonstrates what can be done for agriculture by co-operation. The two previous tenants of the farm had failed. The last one had paid no rent for two years, and could not make the land support himself, one man, and a boy. Last year twenty men found constant employment upon the land, and the farm paid well. So far there had been co-operation for obtaining capital, and co-operation for obtaining land. The next move was co-operation for purchase of raw materials and implements. This was accomplished by forming the Pembury Agricultural Society, and affiliating with the South-Eastern Co-operative Agricultural Society, which is a combination of Kentish agriculturists formed for the purpose of obtaining agricultural requisites (seeds, manures, machinery, &c.) of guaranteed quality at first cost direct from the manufacturers, thus saving for themselves the large profits usually pocketed by the middleman. By this means the members have been able to save 30 to 40 per cent on their purchases of seeds, manures, &c., and many of the villagers who would not join the bank, having no need of more capital, have become members of the Agricultural Society, so that they may avail themselves of the benefits to be derived from co-operative purchase.

"Co-operative capital, co-operative land, co-operative purchase of requisites—still one step to complete our ideal of agricultural co-operation, co-operative disposal of produce. This is what is now especially engaging the attention of the Pembury co-operators. The members of the Agricultural Society intend very shortly to establish a depot in Tunbridge Wells for the sale of produce, and thus obtain better prices for their goods."

Conclusion.

The evidence which has been set forth must be accepted by any impartial observer as proving that the principle upon which these Raiffeisen societies are established is sound, and, further, that they are capable of providing that first step up the ladder which is the most difficult of all for the man who possesses nothing but honesty and willingness to work. Their basis has been described rhetorically, but at the same time not untruly, as the "capitalisation of honesty."

In Scotland, as I understand, the principle has been in a sense recognised in what is termed the system of cash credit, under which a bank advances money on the guarantee of one or more sureties, who have the right of inspecting the account of the borrower. But of course in this case the borrower is a man of means and substance to begin with.

The Raiffeisen banks are avowedly designed to meet the case of the man who has literally or practically no tangible security to offer. It is true that on the Continent the small occupier is commonly the owner of the land he occupies, and in such cases, even if no mortgage is given, there is no doubt the security of the land and his attachment to it as a real, if not a legal, guarantee for the payment of his debts. But it must be admitted that the system seems to have been applied with equal success in districts where the occupiers are not owners but merely tenants-at-will. Personal knowledge by his fellow-members of the character of the borrower, and their watchfulness of the application of the loan, are essentially the security, and it is not difficult to see that the risk taken under these circumstances is small.

The truth is that in these days of cheap cynicism it is a kind of general assumption that every man is a rogue if he gets the opportunity. No doubt the constant revelations of the newspapers may well give support to the impression; but after all, every one knows that while it may be true to say in business matters that "one never knows whom one may trust," it is equally true that the large majority are perfectly trustworthy. It is not because every man is dishonest, but because one or two out of a large number may be, that in commercial matters the prudent man requires security from all. In the case of these village credit associations the conditions of rural life allow of a far more intimate knowledge of the character of individuals than is possible in ordinary commercial life. The man who is doubtful in his dealings, or has the reputation of being a spendthrift, or has not been sufficiently long in the district to become known, is not admitted as a member, or at any rate is not trusted with a loan.

Two instances to indicate the reliability and honesty of the respectable working class may be mentioned from the experience of self-help societies in London. The Self-Help Society of St Pancras, consisting largely of costers and railway hands, in six and a half years lent out about £8500 and has only lost 7s. The Self-Help Society of Ealing lent in six years over £5000 and did not lose a farthing. In respect of only £11 have the sureties been called upon, and in that case £6 had been guaranteed by the vicar, who was considered fair game for pillage, and has been disqualified, for his own protection, from serving as a surety in future.

But it is essential that these credit associations should be co-operative, not philanthropic. Mutual self-help is the only basis on which they can exist, for if they are mere vehicles for charity they will demoralise and not elevate their members. Mr H. W. Wolff puts this point clearly in his book. He says ('People's Banks,' p. 33):—

"Institutions like those now contemplated, formed to assist poor people with money, which is to be well expended and honestly repaid, to be of any real benefit to the borrower—

to promote useful outlay and thrift and honesty—must not come to him like little Providences from outside, with a strange face and a condescending air,—Providences whose gifts cost him nothing, and, for aught that he is aware, may cost no one else anything, and may be repeated *ad libitum*, —but must be his own creation, raised up, as Signor Luzzatti, the founder of the Banche Popolari, puts it, 'by a heroic levy on his daily wages.' *If he is to value the gift, he must be his own benefactor; if he is to deal scrupulously with it, he must be its guardian.* The rich man's dole, coming as from a rich man, is held in comparatively slight estimation, as issuing from a full treasury in which it will not be missed."

It is hardly necessary to reiterate, in conclusion, the self-evident fact that these agricultural banks on the Raiffeisen system are adapted only for small holders, peasant proprietors, cottiers, and the like, and do not profess to meet the requirements of tenant-farmers as a class. This, no doubt, limits their possibilities in Great Britain. The point was at once taken by the Royal Commission on Agriculture, when Mr Wolff gave evidence in 1894 on this subject:—

"*Q.* This [Raiffeisen] system appears to have originated in districts where there is a considerable number of quite small tenants or small proprietors? *A.* Yes.

"*Q.* And then gradually to have extended? *A.* Quite so.

"*Q.* But in England, as a general rule, in the agricultural districts the number of small tenants is limited? *A.* I know that is so; that is one of the difficulties. But then we are going to increase them, I think, considerably, under the Parish Councils Act; we are going to have a good many small-allotment holders."

No doubt there are a good many allotment-holders, even if they have not increased very rapidly; and to them, and those like them, Village Credit Societies may in many cases be found to provide a practical, and at the same time an educational, means of ameliorating their position, and, by improving their prospects of advancement, help to check that depletion of our rural districts which all lovers of their country must deplore.

RECLAMATION OF BOG-LAND IN AYRSHIRE.

I. COMMON FARM, AUCHINLECK.

By JAMES CLARK.

THE subject I am to report upon is the reclamation of moss-land with a view to the growth of timothy hay. The land is situated at an altitude of 700 feet above sea-level, in the uplands of Ayrshire, on the Common Farm, Auchinleck, on the Ballochmyle estate belonging to Sir Claud Alexander, Bart. This was at one time purely a sheep farm, but by drainage and reclamation it has been made to carry a stock of dairy cows, which have proved much more remunerative and more certain rent-payers than the wooled tribe. Although the farm is situated in the moor-edge there is little natural meadow-land to produce winter food, and the reclamation of moss has been resorted to to provide this by the growth of timothy hay. This hay is second to none for wintering dairy cows, being much more nutritious than ordinary natural meadow hay raised at the same altitude.

The reclamation on this farm extends back as far as thirty years ago, and a field of five acres, sown out twenty-five years ago with timothy, is still growing an excellent crop year after year without showing any signs of decay. This field is top-dressed with about 10 tons of farm dung during the winter, and 1 cwt. of nitrate of soda per acre in the spring. This has been carried out annually for fourteen years—that being the length of my management here. Other two fields, which are being treated exactly in the same manner, are producing excellent results, after being sown out twenty and ten years respectively.

Character of the Land.

The reclamation I am now to detail was begun in the summer of 1893. The land was of a benty nature, mixed with heather and draw-moss growing on black peat-moss, varying in depth from 18 inches to 5 feet, with a cold, blue clay subsoil. The value, or rather the rent of the land, was about 2s. 6d. per acre, and I considered it ample rent, as neither cattle nor sheep would eat the herbage, and it was, as a rule, burned to rid it of the "winnle-straes" it produced. The surface was most uneven, being of a broken nature, with two old peat-breasts and an old dam coming in as serious obstacles to deal with. It was, however, convenient for roads, and in close proximity to the steading.

Method of Reclamation.

When I commenced operations I first had the dam filled in with the earth that had been thrown out at an earlier period, and I was allowed £9 by the mineral tenants for this work. I next had the peat-breasts sloped down in such a way that horses could walk over with safety.

Drainage.

This accomplished, I commenced draining; and, as it plays an important part in an undertaking of this kind, I shall describe the method of drainage. I first laid off the main drain, which I almost invariably made in the natural watercourse. The ordinary field-drains were laid off, 18 feet apart, at right angles to the main wherever this was practical. The main drain was made 3 inches deeper than the ordinary drains, to give a fall to the water from the latter.

As moss drains are distinctly different from clay ones, I cut the main to the very far side of the field from its outlet, and allowed it to remain open. I next cut the farthest away ordinary drain—that is, the one at the top of the main—and always tiled the drains from the top downwards, and we finished the main in the same fashion as we came down. This prevented any sludge from getting into the tile, and obviated any fear of choking. The depth of the drains was regulated according to the depth of the moss. In this instance they vary from 2 feet 3 inches to 3 feet 6 inches. I do not like them far into the clay—not more than 6 inches—as the greatest volume of water is usually found between the moss and the clay. But where the moss was found to be over 3 feet 6 inches in depth—which was the rule in this instance—I placed a beechwood sole under the tile to prevent it from sinking.

The cost of the drains was made up as follows: cutting, laying, and filling averaged 6d. per imperial pole; 6-inch tiles for the main cost 1¼d. each; 2½-inch tiles for the ordinary cost 23s. per 1000; and beechwood soles 1s. 3d. per 100 feet. The average cost per acre was £7, 10s.

Manuring.

The next stage in the operations, the manuring of the land, had a great deal to do with the success of the undertaking. Close by is a mining village, where I have the privilege of emptying the ashpits. When judiciously applied this manure has a wonderful effect in pulverising, and nourishing plant life on moss-land. New moss-land must have plenty of manure put on to it, and my experience is that it cannot be overfed at this stage. I gave the land sixty cart-loads to the acre, spreading it broadcast between the drains; and as the ashpits require to be cleaned periodically, I found this a capital outlet for their contents during the summer months. On the top of this the land got a dressing of roadside parings, and 5 tons of gas-lime to the acre, which helped greatly to cut the tough sward.

Ploughing.

Ploughing was commenced in June 1894. June is the best month in the year for this work, and it is the slackest time both with the horses and men on this farm. At this season there is less risk of the horses sinking in the moss, which is a strong point in favour of summer cultivation. I used a common swing-plough for ploughing, with a tail of about 6 inches in length on an ordinary sock, but sharp in the edge, so that it would cut and not tear the tough roots. The coulter also was kept sharp, and bent in a way that nothing would gather on it.

A pair of useful Clydesdale horses managed to do the work, but they had to be calm-tempered steady pullers. Restive horses are useless for this work. The land was ploughed close up to every drain and scaled out between them. This prevented the risk of horses stepping into the drains, which were as yet soft. It was ploughed with as small a furrow as possible, which is advantageous both for the horses and the land.

First Crop.

At this time I ploughed all the 6 acres of land that had been top-dressed. I sowed this with oats in the following spring, and top-dressed it with 4 cwt. of dissolved bones per acre. It produced a bulky crop, the straw soft and the grain light, but still quite up to my expectations.

Further Reclamation.

During the summer of 1895 I broke up the remaining 4 acres, and had intended putting the manure and soil on the top of the ploughing, instead of ploughing it in, to determine which was the better way; but the weather being exceptionally dry I adopted another method of dealing with the tough sward—that is, I had the furrows burned off. This I did by kindling fires every here and there over the whole area, and in a fortnight the whole furrows had been converted into peat-ash. The weather still remaining dry, it was top-dressed in the same way as the previous 6 acres. Immediately this was done it was ploughed, and I was much pleased with its appearance. It turned up like red land, more advanced than what had been broken up a year before.

Second Crop—Turnips.

After harvest the whole 10 acres were cross-ploughed in preparation for turnips. The spring of 1896 being very dry I managed to work it without many mishaps; but this is the most critical stage for the horses, as the sward is now broken up and very little rain makes it soft. Nothing but cautious dealing will do; I used neither belly-band nor britchen on the horses when they were in the carts, so that in case one went down all that had to be done was to loosen the hame-strap and throw up the cart. The land was drilled 30 inches apart, and in the drill there was applied twenty cart-loads of farm dung to the acre, along with 3 cwt. superphosphate and ¾ of a cwt. of sulphate ammonia sowed broadcast before covering. The turnips were sown between the 15th and 28th May, and were all singled by the middle of June. They turned out to be a capital crop, averaging quite 20 tons to the acre.

Third Crop—Oats.

I had intended ploughing in the corn early in 1897, but owing to the wet weather this could not be done till the beginning of April. I think it a capital plan to plough in oats on black land, as it gives the seed a much firmer hold of the ground, and is not so liable to lodge. I have practised it with excellent results—when I got a capital "tid."

I sowed Early Fellow oats, and top-dressed with 5 cwt. dissolved bones. After a level surface had been made with the harrows I sowed 15 lb. Scotch timothy seed along with 1 bushel perennial ryegrass seed to the acre, giving it one turn with the harrows before rolling.

The season being very favourable I reaped one of the best crops I ever had of standing grain, both straw and grain being of excellent quality, threshing quite 60 bushels of 40 lb. weight to the acre.

First Crop of Hay.

Immediately the crop was harvested the land was top-dressed with 10 tons of farm-dung to the acre, to preserve the seeds from being destroyed in winter by sheep which have a run over the whole farm. In the following spring the land got a top-dressing of 1 cwt. of nitrate of soda. The hay was cut in the first week of July, which was a fair crop, amounting to 2 tons per acre. A capital bite was afforded the cows in the aftermath, and they have shown their appreciation by the way they have cut it down to the bone. The 4-acre portion that was burned was far and away the easiest manipulated, but did not grow quite such heavy crops as the other part, where, however, the land is cleaner. Altogether I am satisfied with the result.

Results.

I am satisfied with the result of the whole undertaking, not only because it has greatly improved the amenity of the place, but because it will be a great boon to the farm for the production of winter food for the cows, the very object for which it was intended. Nothing has paid on this farm like the reclamation of waste land. I find that by the time I have had a rotation of crops reaped I have been repaid first cost, with land left easily worth 20s. per acre.

Although confident that reclamation pays, I do not believe in tackling too much at a time, as it wears out horses quickly, and ploughmen sour at the work. Indeed, few men are able for this kind of work, as it is anything but plain sailing. Now that the subject on which I have just reported is in a sense completed, I have 5 acres drained and ready for breaking up next summer. I mean to treat this in the same manner—that is, if the weather is sufficiently dry I shall burn the first furrow, and if that cannot be accomplished, I shall plough and top-dress in preparation for oats the following spring.

DETAILS OF RECEIPTS AND EXPENDITURE.

Receipts.

1895.	6 acres oats, 35 bushels per acre at 2s. per bushel	£21	0	0
	Straw of do., 30 cwt. per acre at 30s. per ton	13	10	0
1896.	10 acres of turnips at £8 per acre	80	0	0
1897.	10 acres of oats, 60 bushels per acre at 2s. per bushel	60	0	0
	Straw of do., 2 tons per acre at 35s. per ton	35	0	0
1898.	20 tons of timothy hay at £2, 10s. per ton	50	0	0
	Total receipts	£259	10	0

Note.—I have not credited anything for the eating of the seeds with sheep or the aftermath with the cows, but on the other hand I have allowed nothing for the rent of land.

Expenditure.

Labour Bill.

Carting 600 cart-loads manure at 6d. per cart .	£15	0	0			
" road-parings, clay, &c. . . .	10	0	0			
" 200 tons stable and farm dung at 1s. per ton	10	0	0			
" 50 tons gas-lime at 1s. per ton . .	2	10	0			
" turnips at 15s. per acre . . .	7	10	0			
Ploughing (breaking up) at £1 per acre .	10	0	0			
" 4 acres after burning at 10s. per acre	2	0	0			
" stubble and red land, 20 acres at 10s. per acre	10	0	0			
Working turnip-land and sowing £1 per acre .	10	0	0			
Sowing, harrowing, and rolling at 6s. per acre .	4	16	0			
Singling, cleaning, and shawing turnips at 15s. per acre	7	10	0			
Harvesting, threshing, and marketing oats at 18s. per acre	14	8	0			
Making and stacking hay at 10s. per acre .	5	0	0			
Burning and levelling, &c.	2	0	0			
				£110	14	0

Manure Bill.

50 tons gas-lime at 1s. per ton . . .	£2	10	0			
3 tons 14 cwt. dissolved bones at £5 per ton .	18	10	0			
100 tons farm dung at 3s. per ton . .	15	0	0			
100 tons stable manure at 3s. per ton . .	15	0	0			
1½ tons superphosphate at £2, 1s. 6d. per ton .	3	2	3			
7½ cwt. sulphate ammonia at 8s. per cwt. .	3	0	0			
				57	2	3

Seed Bill.

5 bags oats, 30 bushels at 2s. 3d. per bushel .	£3	7	6			
8 bags oats, 48 bushels at 2s. 6d. per bushel .	6	0	0			
10 bushels ryegrass seed at 2s. per bushel .	1	0	0			
150 lb. timothy at 4½d. per lb. . . .	2	16	3			
40 lb. turnip seed at 8d. per lb. . .	1	6	8			
				14	10	5

Miscellaneous.

Draining 10 acres at £7, 10s. per acre				75	0	0
Total expenditure .				£257	6	8

II. SOUTH PALMERSTON FARM, OCHILTREE.

By Daniel Robb, F.H.A.S., &c.

The land about to be reclaimed consisted of 8 acres of deep, wet mossy soil, on the farm of South Palmerston, Ochiltree, on the Ayrshire estate of the Marquis of Bute. The original value of the land was almost nil, from the fact that the greater portion of it was covered with heather, broom, gorse, and other coarse plants. The only time that stock of any description were grazed on it was after a severe snowstorm or in very hard frost, when, owing to the rough nature of the ground and growth, they could pick up a little food on it. The farm being a dairy one, and having little or no natural meadow-land, the chief aim, after reclaiming this land, was to lay it down into a permanent timothy meadow, so as to produce a good supply of superior fodder, and with as little outlay as possible. Should the experiment prove a success, it promised to be a benefit in this way, that less ploughing would be needed, and there would be more land for pasture. The land, from its low-lying position and general appearance when turned up, must undoubtedly have been covered with water at some remote period. The subsoil, wherever it was reached, was found to consist of a stiff, tenacious blue clay. In some parts, where the moss was not nearly so deep, beds of stones were to be found. These had evidently been deposited there by water.

The land lies about 450 feet above sea-level.

Method of Reclamation.

The first step in the reclamation, begun in 1885, was to clear the surface. This necessitated the rooting out of gorse, broom, &c., and the burning off of the remaining heather, rushes, and other rubbish.

Drainage.

The land being of a wet, boggy nature thorough draining was imperative. The proprietor's agent agreed to drain it on the terms customary to the estate—viz., the tenant to do the carting of pipes and pay five per cent on the capital expended, the proprietor engaging men to do the work to his satisfaction. The work was immediately commenced, and, so far as fall and outlet were concerned, did not prove a very difficult matter. There was a fairly good fall, while a fine outlet was got into the river a quarter of a mile from the field.

The land was so boggy and soft that it was impossible for a horse to find a secure footing on the greater part of it, only a very limited border round the edge being considered safe. The pipes for these boggy places had therefore to be conveyed with handbarrows. This process entailed a great amount of extra labour, and, according to agreement, this fell to the tenant to perform. The farm road runs parallel with the ground, and thus lessened the labour to a considerable extent.

An important and difficult point in the drainage was to obtain a reliable bottom. This in some places was very bad, and it was quite evident that if the tiles were laid without using soles it would be very unsatisfactory, as some of them would sink and render the drain useless. As no land of this kind had, in modern times, been drained or broken up in the locality, no very reliable information could be obtained to assist in this matter.

As to depth, 3½ feet was considered to be quite sufficient. This, of course, could scarcely be kept uniform, owing to some slight irregularities of the surface. It is now becoming very evident that this depth is not sufficient for land so soft and spongy as this was. The land has since become a great deal more consolidated, resulting in some places in a general subsidence of about 18 inches, and even more in some of the softest parts. This is gradually bringing the pipes very near to the surface, and at some time in the near future they will require to be deepened if the land is to be kept under cultivation.

It was decided to form the drains 18 feet apart. This seems to be very near the proper width, as the land is always dry enough.

As to pipes, 3 inches was the diameter of bore selected for side drains. This is a half inch more than usual, but it was thought advisable to use this size owing to the large amount of water in the soil. The ordinary cylindrical pipe was chosen, with sole made of first-class clay and of good workmanship. These were obtained at a tilework about two miles distant, and cost—

6-inch pipes	11s. per 100.
5 " "	85s. per 1000.
4 " "	45s. "
3 " "	32s. 6d. "
2½ " "	23s. 6d. "

For the main drain, extending to the river, 6-inch pipes were used, as the water from drains in adjoining land had also to find an outlet by this source.

Cost of Drainage per Acre.

The cutting, laying, and filling of drains were let as a contract, the specified distance being, as before stated, 18 feet wide and 3½ feet deep, with soles supplied for places where a satisfactory bottom could not be obtained.

The cost of cutting and filling per acre .	£6	15	7½
3-inch pipes, 2420 at 32s. 6d. per 1000 .	3	18	7¾
Soles for some parts where needed (average) .	0	10	0
	£11	4	3¼

This did not include 1300 6-inch pipes for main drain, which cost £7, 3s., together with 5s. for a grating for outlet, items which should of course go against the whole extent. The soles used were 4 inches broad by a half inch thick, made of beech, which stands well when kept constantly wet. The cartage of the pipes was done by tenant free of charge. The work of cutting was comparatively easy after the old turf had been removed, the greatest difficulty being to keep the sides in some places from slipping in. To cope with this a strong force of men had to be employed, so as to follow closely upon the cutting with the laying of the pipes and soles where necessary. In filling the drain the tough surface sod was put next the tile, then the remainder followed.

Breaking up the Land.

Having now got it drained and the stones removed, together with a good many bog oaks that turned out, the next step was one which promised to be a very difficult task—viz., that of getting it broken up. As before stated, it was practically impossible for horse-labour to be employed in some parts, and as it proved to be a great deal worse when the surface was broken, the idea of horse-labour had to be altogether given up. The only resource was to employ men to dig the softest places. This was rather expensive, the digging involving an outlay of £45. It made a very good work, however, burying the turf surface much deeper than the plough could accomplish.

Where the plough could be used, it had to be provided with an extra long tail on the "sock" or cutting-share. By this means the furrow was completely cut out at the edge and turned over much more readily. It also lessened the draught considerably, as without this, a part of the furrow being uncut, it had either to be torn away or the furrow remained standing on the edge. Owing to it being so difficult to break up, only about a third, between plough and spade, was accomplished by the spring.

First Crop.

The first crop sown was oats, so that it might assist in decomposing the surface and gradually work it into a state suitable for green-cropping. The seed—about 5 bushels per acre—was sown with the hand in the usual broadcast way. Here again a horse implement to cover the seed was an impossibility. A light harrow was therefore constructed of brushwood for the purpose, and drawn by men. This, as can be imagined, was not very impressive on the tough surface. Yet it was sufficient to cover the seed.

No manure was given, yet the crop was a luxurious one, so much so that it had all to be cut by the shearing-hook. This part of the work was let by contract to experienced hands, and for cutting, binding, and stooking the cost was 15s. per acre. When the corn was ready for stacking, some of it in the boggy parts had to be carried by hand pretty near the farm road.

The exact weights of the crop I am sorry I cannot give. Such of the straw as was fit to be consumed as fodder was given to the young stock, the rest being used for litter. The sample of grain was fairly good, but the quantity was not quite equal to the amount of straw, averaging about 45 bushels per acre.

During the next winter the remainder of this land was broken up, partly by the plough and partly by the spade. By this time the effect of the drains was being felt, and although it was yet very soft, there was a decided improvement.

Second Crop.

The part that had been in corn in the previous year was intended to be planted with potatoes in the spring. With this in view the land was fallowed early in the autumn, so that it might assist too in decomposing the old surface, that still remained quite fresh. This had the desired effect to some extent, but it still proved very difficult to get it into a proper tilth. After a considerable amount of grubbing and harrowing it was got into drills, but at the time considered very unsatisfactory in its turfy condition. In fact, it was thought almost impossible for potatoes to grow in such a place.

The potatoes were planted in the usual way, the principal variety being the Champion. Where it was possible to get on with horse-labour, about fifty cart-loads of dung was given per acre, together with fully ½ cwt. potato manure. In the other parts where farmyard manure could not be got on, it was substituted by an extra quantity of special potato manure. The after treatment and management of the crop was as usual.

One point of special interest I may mention. Instead of the rough turfy condition of the ground being a drawback, it was found to be singularly favourable to the crop. The crop turned out a splendid one, and just underneath the largest turfs were found the biggest potatoes. The whole crop, with the exception of what was required for household use, was pitted in the field and sold in the spring, principally for seed, at £5 per ton. It was then found that the crop had averaged 8 tons per acre.

It is noted from experience since breaking up this land, that if potatoes are planted on it several times in succession they degenerate very quickly in vitality, resulting in a large number of blanks.

Further Reclamation.

The remainder of the land was brought under cultivation in the same manner—with this exception, that two white crops were taken before any attempt was made at green-cropping. In planting some of the boggy parts with potatoes it had yet to be done with the spade, as it was still too soft for horse-labour to be utilised.

Since breaking it up crops of carrots and turnips have been grown. The carrots were never very satisfactory, as there was always a great difficulty in getting a good braird, and even then they seemed extremely liable to be attacked by "slugs." Although there must be a decided want of lime in the ground, the turnips do very well when they are given a fair supply of farmyard manure, with 3 to 4 cwt. superphosphate, producing a crop of about 18 to 20 tons per acre.

Timothy Meadow.

The main object, as before stated, having been to lay the land down to a permanent timothy meadow, it was now—after being got into thorough cultivation—sown with oats and a mixture of seeds consisting of the following:—

Perennial ryegrass . . .	½ bushel	per acre.
Italian "	½ "	"
Timothy	20 lb.	"
White clover	3 "	"
Alsyke and red . . .	2 "	"

These seeds were sown along with the oats, so that they had a year to establish themselves. The oat crop, which was in some parts rather heavy and laid, was against the young seeds; but in fact the latter made a very bad appearance, and were altogether disappointing. In the month of January a good top-dressing of dung was given, but not even then did it seem that much of the timothy had grown. The timothy has proved to be rather a failure, for many attempts have since been made to get it properly laid down, and in some parts it has been found impossible as yet to get a proper "catch."

The method which has produced best results is to plough it out of lea, taking only one crop of oats, and sowing down. By this means a more solid surface is obtained, which seems to favour the timothy getting a proper hold. Although a good "catch" has been obtained, it is very liable to be thrown out by a severe frost.

The land has now been a good few years in hay, and although in some parts the quality is not all that could be desired for market purposes, yet there can be raised from 30 to 40 cwt. per acre of excellent fodder for dairy cattle. Where it was most difficult to get the timothy to establish itself, a good dressing of marl road-scrapings, &c., have had a very good effect.

Value of the Land now.

Taking into account the present state of agricultural prices, from 15s. to 20s. per acre may be taken as the value of the reclaimed land, and for this value, with the improved appearance it gives to the district as a whole, the undertaking may be looked upon as quite successful.

Another Method of laying Land to Grass.

It may be well to mention here another method of laying down such land that has come under my observation recently —viz., on breaking up from pasture, instead of sowing oats as a nurse for the young seeds, rape is substituted, and eaten off by sheep. The benefits derived from this method are many. In the first place the young seeds are in no danger of injury from the crop lodging, as often happens when the oat crop is heavy, while the seeds have greater freedom with more air and sunshine. In the second place, the trampling of the sheep while feeding on the rape consolidates the land far beyond anything that could be attained by ordinary rolling. In the third place, the young seeds are getting the benefit of the manure produced by the sheep. The result of this system has, as yet, been excellent, not a single blank being left, even on places that previously had been a failure.

In conclusion, I wish to mention two important points that have come under my notice in the improvement of this land—viz , in draining soil, of such a nature as that described, it would be of great advantage if, in the first instance, some temporary draining could be effected, so as to draw away a great amount of the water, and bring the soil into a more solid state before using the tiles. By this means the subsidence would take place, to a large extent, before tiles would have to be used, thus averting a defect that would in future years involve a great amount of labour and expense. The second point is, there can be no doubt that a good dressing of lime would prove highly beneficial at the outset (as has been proved from various small experiments), for besides breaking up the tough surface, it helps to consolidate the open, loose soil, neutralises the organic acids, and provides one of the main elements so deficient in moss-soil.

INSECT PESTS OF DOMESTICATED ANIMALS.

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THE animal parasites of the domesticated animals belong to the group of Invertebrates, and are to be found in three series of these—the Protozoa, the Worms, and the Arthropoda or jointed-footed animals.

The Arthropods are subdivided into the following classes:—

(*a*) Crustacea—the Crabs, Lobsters, Shrimps, and Slaters.
(*b*) Myriapoda—the Centipedes and Millepedes.
(*c*) Insecta—the Insects.
(*d*) Arachnoidea—the Spiders, Scab Mites, Gall Mites.

In this treatise we are concerned with the Insects, which may be distinguished from their nearest allies by the possession of the following characters:—

(1) One pair of antennæ or feelers.

(2) Three pairs of legs when adult

(3) A division of the body into three well-defined regions—a head, carrying the eyes, mouth-parts, and antennæ; a thorax, carrying the legs and wings; and an abdomen, as a rule without external appendages.

(4) The mode of breathing is very characteristic, and a knowledge of it is necessary, as the means of procedure against insect pests have often a very distinct relation to the mechanism of insect respiration. There are no such organs as lungs in the insect world. The necessary air passes into the body of the insect, not through the mouth, but by a series of openings down the sides of the body, called spiracles or stigmata, and thence into main tubes or tracheæ, which give off finer tubes, and so on, a complete system of such pipes piercing to all parts of the body, out into the legs and wings, and even to the tips of the antennæ. Thus insects in various stages of development may be suffocated by dusting their bodies with substances which will choke up their breathing-pores, or which, as a spray or vapour, will enter and pass through their tracheæ, causing death, as will appear later.

If we exclude one or two beetles whose larvæ are occasionally harmful to birds—*e.g.*, pigeons—the parasitic enemies of the domesticated animals are comprised within three Orders—the Neuroptera, the Hemiptera, and the Diptera.

THE NEUROPTERA OR NERVE-WINGED INSECTS.

These are insects with biting mouth-parts and four wings characterised by a great number of longitudinal and transverse veins. Wings are absent in the section Mallophaga or biting lice. The metamorphosis may be complete or incomplete.

Excluding the Mallophaga and, abroad, the white ants, there is scarcely a member of the order which can be classed by the economic entomologist as harmful, while a number are useful in the sense that they prey on injurious insects. Using the name Neuroptera in its widest application, we include such insects as the day-flies or may-flies (Ephemeridæ), with their aquatic larvæ and their short imago life, and the caddis-flies (Trichoptera), with their case-making larvæ, common in streams. The Duns and the Drakes and the Spinners, well known to anglers, are members of these two sections. Useful are the dragon-flies; the Chrysopidæ or lace wings, whose eggs stand out on the ends of threads, and whose larvæ prey on green-fly; and the Hemerobians, whose larvæ decorate themselves with the empty skins of the sucked-dry Aphides.

The larvæ of the ant-lions also prey on insects. Each larva hollows out a cone-shaped pit in some sandy place and lies almost hidden at the bottom of it, ready to fall upon any careless or curious insect which, having ventured over the edge of the pit, rolls to the bottom. The luckless insect is at once seized in a pair of terrible jaws, and soon its indigestible remains are tossed out and a good bit away from the ant-lion's pit, so as not to "discourage the others."

Odonata or Dragon-flies.

I have often heard the dragon-flies called "horse-stingers," and the name the "devil's darning-needles" applied to them seems fairly to express the popular notion that these insects are to be avoided as dangerous. This notion, however, is quite wrong; for these graceful active fliers—the swallows of the insect world, in flight as in diet—live on insects, their prey being taken on the wing.

It is true that dragon-flies are voracious, but to human beings or to stock they are quite harmless. According to the species, after pairing the eggs are either dropped into the water or the female crawls down a water-plant and lays them below water. The sluggish larvæ from these eggs live on water insects, snails, and even small fish, which are seized by a terribly efficient part of the mouth called the mask. There is no real resting stage in the life-history, but the nymph crawls out of the water on to the bank or up the stem of some plant, and the skin splitting along the back, the adult dragon-fly, after a short time necessary for the spread and drying of the wings, flies away.

Mallophaga or Biting Lice.

The Mallophaga—wool-eaters, as their name means—are parasites which live not on blood but on epidermal scales, feathers, hairs, scurf, &c.; indeed by some they are regarded as "mutualists"—*i.e.*, as living in partnership with the host and doing it a service by keeping the external part of the body free from waste matters. There can be little doubt, however, that in numbers they are the cause of itching, unrest, and irritation.

The Mallophaga are flattened, and their mouth-parts are fitted for cutting and biting. They have large broad heads and short antennæ. The prothorax is distinct, but the second and third segments of the thorax, if present, are not marked off from the abdomen. The short legs—in one section more fitted for clinging, in another more for locomotion—have one or two claws. Wings are absent. The metamorphosis is incomplete. Pear-shaped eggs are laid on the hair or feathers (they may be hung by threads), and the young which hatch from them differ externally from the adult only in size, and they become sexually mature after some moultings. Mammals may be the hosts, but birds chiefly, hence the Mallophaga are often called the "bird-lice."

Authorities have hitherto distinguished two sections of biting lice—namely, those which have palpi to the maxillæ and those which have not. Dr Sharp,[1] however, quotes Grosse as declaring that palpi are never present. Although scientifically, then, this distinction may break down, for practical purposes we will here still retain the division into two—viz., the Philopteridæ, characterised by their comparative sluggishness, their feet being more adapted for clinging; and the Liotheidæ, more active insects.

The Philopteridæ are said to remain on a host which may die, when they themselves soon perish; the Liotheidæ, on the other hand, in the case of death desert their dead host and seek a new living one.

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[1] The Cambridge Natural History Volume on Insects. Part I. by Dr D. Sharp.

THE PHILOPTERIDÆ.

The following table from Railliet may prove useful, determination in each case being made by the microscope:—

Antennæ 3-jointed, tarsus ending in a single claw. On mammals. TRICHODECTES.

Antennæ 5-jointed, tarsus ending in two claws. On birds.	Antennæ different in the two sexes.	Body narrow.	Third joint of antenna of male without an appendage. ORNITHOBIUS.
			Third joint of antenna of male with an appendage. LIPEURUS.
		Body wide.	Antenna of male with appendage to third joint. GONIODES.
	Antennæ resembling in the two sexes.	Body wide.	No tubercles in front of the antennæ. GONIOCOTES.
			Mobile tubercles. DOCOPHORUS.

Trichodectes.

This genus is found on the horse, dog, ox, sheep, goat. The species have wide flat heads beset on the upper surface with hairs. There are two segments to the thorax, the first well marked, the second made up of fused mesothorax and metathorax. The thorax is followed by a 9-jointed abdomen with scattered hairs, most marked at the edges. Towards the end of the abdomen the broader females carry two appendages, and they may be further distinguished from the males by the cleft end of the abdomen, this in the male being either rounded or not conspicuously cleft.

Ornithobius.

This insect, slender and transparent, has the swan for its host. It is about one-sixth of an inch long and whitish in colour.

Lipeurus.

The genus Lipeurus, with elongated narrow body, is found on fowls, ducks, geese, turkeys, pigeons, pheasants. We may take as an example *Lipeurus variabilis*, which lives in numbers among the feathers of the domestic fowl, preferring, as Denny says, "the primary and secondary feathers of the wings, among the webs of which they move with great celerity." The rounded head is bordered in front by an antenneal band. The hind segment of the thorax is larger and broader than the prothorax. On the under surface of the thorax is a brownish spot. The abdomen shows spots and bands; it is cleft in the female and has a lance-shaped genital spot. From the edges of the abdominal segments hairs project. The prevailing colour is pale yellow, with the spots fawn-coloured, and dark-coloured bands. The male measures 1·9 mm. to a little over, and the female 2·2 mm. to a little over.

A slightly smaller form also infesting the fowl is *Lipeurus heterographus*, with a head not rounded but in the shape of a parabola.

The Goniodes.

These have flatter wider bodies than the last. The head is large. Of the 5-jointed antennæ, which are sunk in little pits, joint 1 in the male is the biggest and strongest, and joint 3 in the same sex carries an appendage.

The Goniocotes.

These are also flattened wide forms. There is no difference in the antennæ of the two sexes, but the antennæ are not sunk so deeply as in the Goniodes, and may spring almost directly from the edge of the head.

The species of both the last genera infest gallinaceous birds and pigeons.

Goniodes dissimilis (Nitzsch), the chicken Goniodes, measures —the male almost 2 mm., the female 2½ mm. Head wider than long. The abdomen is broad and oval, and bears on the middle of each segment two bristles, and at both edges of the segments three or four bristles. At the edges, too, are somewhat curved spots. The general colour is whitish, the spots being darker and the bands fawn-coloured.

Goniocotes hologaster (Nitzsch), the chicken louse, is much smaller, the male being about ·9 mm. and the female 1·3 mm. Head as wide as long, and broadest just behind the antennæ. Colour yellowish, darkening at the thorax; bands brownish-black.

Docophorus.

This genus, with head longer than broad, is found on the swan and duck.

THE LIOTHEIDÆ,

fitted for running.

Tarsus with one claw. Living on mammals—chiefly rodents.		GYROPUS.
Tarsus with two claws. Live on birds.	Thorax with three distinct segments.	TRINOTON, lives on web-footed birds—such as geese, swans, ducks.
	Thorax of two segments.	Orbital sinus (*i.e.*, a notch in front of the temples where the eye is situated) deep. COLPOCEPHALUM, found on pigeon.
		Orbital sinus shallow or absent. MENOPON, on many birds, rarely on mammals.

Menopon pallidum (Nitzsch).

This, the commonest and the most troublesome of all lice which infest the fowl, running with great nimbleness among the feathers, has been known for a very long time, the insect being met with in literature under various names during a period of two centuries. The head in front is somewhat angular, and somewhat crescent-shaped. The temples are rounded, and bear four bristles and a few hairs. Thorax the same length as the head in the male, but the thorax of the female is longer than the head. The abdomen is oval and elongated, longer and narrower in male, and each segment carries a series of bristles. The sides of the abdomen are not jagged. The male has four long bristles at the end of the abdomen. Colour, pale-yellow, with the spots on the abdomen bright fawn.

Menopon biseriatum.

This insect is known from *pallidum* by the more rounded head, by the fact of its having two series of bristles to each abdominal segment, and by its larger size, the male measuring up to 3·3 mm., and the female, which in this species is smaller than the male, reaching 3·2 mm. While it has been taken on the fowl, Osborn[1] says "it would seem to be confined more particularly to the Phasianidæ, and of these to infest particularly the pea-fowls and turkey, its occurrence on the hen being only occasional. It would evidently pass readily from any of these birds to others in the same family."

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[1] The Pediculi and Mallophaga, by Professor Herbert Osborn, U.S. Department of Agriculture (1891).

Preventive and Remedial Measures.

The preventive and remedial measures to be adopted against the biting-lice will be detailed along with those directed against the sucking-lice.

THE HEMIPTERA.

This order of insects, so called because the insects belonging to one sub-order of it have their wings partly leathery and partly membranous, embraces a number of familiar forms—some harmful like the green-flies and the scales, some predaceous like the Reduviidæ or "assassin-bugs," and some useful to man, like the cochineal and lac insects.

Characteristic of the order are the piercing and sucking mouth-parts and the incomplete metamorphosis, there being no resting or pupal stage—the young forms that come from the egg feeding, and finally obtaining wings and becoming adult, after a series of moults.

The order is divided into three sub-orders:—

(1) The **Homoptera**, with all the wings (when these are present) of the same texture throughout, and held when at rest sloping like the roof of a house. Beak jointed. *E.g.*, the green-flies, the scales, and the spittle insects.

(2) The **Heteroptera**. The fore-wings thickened at their bases, while at the top they are membranous. At rest the wings lie flat on the back, overlapping at the tip. Beak jointed. Included in this sub-order are the water-boatmen, the water-scorpions, and all the true bugs.

(3) **Parasitica**. Wingless, and beak unjointed. This is the sub-order we are concerned with, and with only one family of it, the Pediculidæ or blood-sucking lice, all of which are mammal-infesting forms.

PEDICULIDÆ.

The members of this family have a sucking proboscis which is capable of expansion and contraction. When not in use it is invisible, having been withdrawn into its sheath. The sheath carries a series of hooklets, which when everted bury themselves in the skin, and so hold the sucking-tube steady. The skin is pierced by the proboscis, up which the blood flows. The head has a pair of simple eyes, and, in the species we shall mention, two short 5-jointed antennæ. The thoracic region is marked by the six legs, which terminate in a 2-jointed tarsus. The second joint of the tarsus ends in a stout claw, which bends up and forms, along with a projection from the lower extremity of the tibia, an apparatus by which the parasites can cling or creep.

The male has a rounded abdomen (fig. 42), while that of the female (fig. 43) is notched. Along each side of the abdomen are the breathing-pores.

The females lay eggs or "nits," which are glued to the hairs of the host. The attached end of the egg is narrower than the opposite end, from which the young issue on hatching. Development is rapid, the young forms, without any resting stage, soon assuming the adult form, capable of reproduction. The old saying, recalled by Butler, that "a louse can be a grandfather in twenty-four hours," although a great exaggeration, is yet expressive of their powers of multiplication.

The following three genera of the Pediculidæ are thus distinguished:—

Thorax as broad as the abdomen, the two passing into one another without constriction. *Phthirius.*

Thorax narrower than abdomen. The abdomen, broadest about the middle, narrows at the anterior end, so that the thorax and the abdomen do not seem sharply marked off from one another. Eyes prominent. *Pediculus.*

Thorax narrower than abdomen. Abdomen and thorax, owing to the difference in breadth, sharply marked off from one another. Eyes absent. *Hæmatopinus.*

Phthirius inguinalis (Leach), *Pediculus capitis* (De Geer), and *Pediculus vestimenti* (Leach) infest man. *Hæmatopinus* infests many other mammals—*e.g.*, horse, ox, dog, pig, goat, camel, rodents; but, according to Neumann, not the sheep, cat, or guinea-pig.

Phthirius inguinalis, the crab-louse, up to one-tenth of an inch in length, may be found in the pubic region, sometimes in the hairs under the arms and even the beard, but not the head. The body is not elongated, but nearly as broad as long, while the legs, spreading out from the sides, give the pest its crab-like appearance. The two front legs are weaker than the hinder pair, which latter are fitted for clinging. In colour the pest is white or yellowish-white, with black on the thorax.

The best remedy is Stavesacre ointment.

Pediculus capitis, the head louse, varies in colour with the host. Thus Taschenberg writes of it as greyish on Europeans, black on West African negroes, yellow-brown on Chinese and Japanese, dark-brown on Indians of the Andes, white in the Esquimaux. The food consists of blood sucked from the heads of infested persons, chiefly children. In six days some fifty pear-shaped eggs (fig. 44) are glued to the bases of the hairs.

In a week the young (fig. 45) will have hatched. In about three weeks these, having meanwhile moulted their skins three times, will be adult.

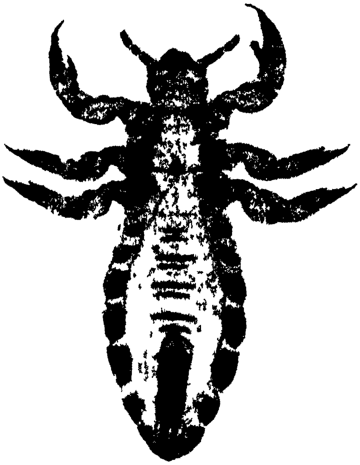

Fig. 42.—Male of *Pediculus capitis*, much magnified. (Original.)

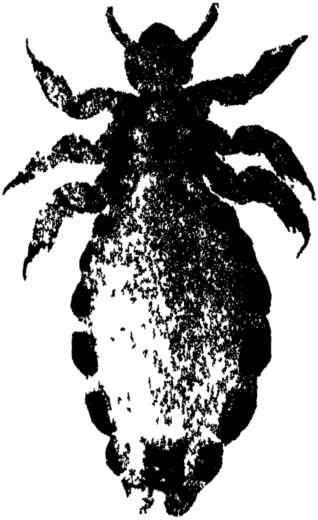

Fig. 43.—Female of *P. capitis*, greatly magnified. (Original.)

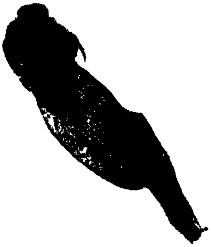

Fig. 44.—Egg of *P. capitis* attached to hair and showing larva hatching, much magnified (Original)

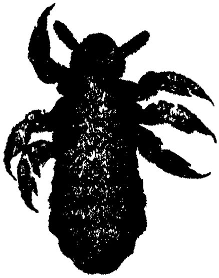

Fig. 45.—Larva of *P. capitis*, much magnified. (Original.)

Prevention and Remedies.—Cleanliness, washing hair with soapy water, or better, a weak solution of petroleum.

A little larger than the last is *P. vestimenti*, the body louse, whose eggs are laid in folds of clothing. Infesting wandering tramps, or sometimes very troublesome in soldiers' camps in war-time, it is not to be feared where clothes are regularly changed and washed, and bathing frequent.

The genus *Hæmatopinus.*

Neither in form nor in life-history is it possible to draw much distinction between the foregoing lice and the members of this genus. The characters agreed on in the books as descriptive of the genus are—the absence of neck-like constriction between the head and thorax; antennæ of five joints; abdomen with eight or nine segments; tarsus with a single claw; eyes may be absent.

Remedial Measures for Lice, both Biting and Sucking.

Animals most likely to suffer will be such as are badly nourished or carelessly tended.

Of ointments which, rubbed into the hair, will suffocate the pests by choking up their breathing-pores, two may be mentioned:—

(1) One part sulphur to four of lard.

(2) Stavesacre ointment made thus: (*a*) Oil of stavesacre one part, lard seven parts; or (*b*) a decoction of one of stavesacre seeds to four of lard.

For rubbing in or for washing there is a large choice of preparations.

(1) A decoction of 1 oz. of stavesacre seeds to a quart of liquid, half water half vinegar.

(2) An infusion of two parts stavesacre to one hundred of vinegar.

(3) One part petroleum to ten of rape-oil.

(4) A 5-per-cent mixture of boiled tobacco or tobacco-juice from manufactured tobacco, diluted in the proportion of 1 to 100.

(5) Benzine one part, soap six parts, water fifteen to twenty parts.

(6) Creolinated water—*i.e.*, a 5-per-cent solution of creolin.

(7) Repeated combing of the attacked animals, the comb being dipped in a strong solution of soda, or comb and brush dipped in carbonate of soda 2 oz., water 1 quart, powdered stavesacre ½ oz., or in kerosene emulsion whose formula is—

Hard soap	½ lb.
Soft water	1 gallon.
Kerosene	2 gallons.

The soap, dissolved in boiling water, is added to the warmed kerosene, and the two churned up together till an emulsion is formed. This mixture keeps quite well, and may be diluted at will.

Whichever of this formidable list of remedies is adopted, the importance of repetition of the treatment in some days must not be forgotten, so that any pests which may have hatched out from eggs which escaped the first dressing may be killed before they have proceeded to reproduction and egg-laying.

Important as preventive and remedial are scrupulous cleanliness and the periodical disinfection of stable, kennel, and hen-house.

In the case of birds, what will be written later under Fleas should be referred to. Besides, dust-baths should be carefully provided. I have pointed out earlier how the tracheæ of insects open to the exterior by spiracles, and where birds have a chance of "bathing" themselves in fine dust they will do much to keep themselves clean, for the fine dust will get into the spiracles of the lice and clog them up, inducing suffocation. Lysol, a preparation familiar to veterinarians, has a certain use against lice. I know of an experiment where a large number of fowls were dipped in a one per cent solution of lysol in water, and with excellent results. In dipping, the birds had to be gripped by their bills so that their mouths might be kept shut.

THE DIPTERA OR TWO-WINGED FLIES.

The Diptera, or True Flies, is a large order of insects characterised by the possession of a pair of wings borne by the large middle segment of the thorax. The hind-wings are replaced by a pair of "balancers," well seen in the daddy-long-legs, which seem in some way to aid the insect in maintaining its equilibrium.

The adults have no jaws, their mouth-parts being fitted for a liquid diet. Some diet innocently on honey. To aid those which live on blood or animal juices to gain access to such food some of the mouth-parts are modified as lancets, by which the wounds are made whence the blood is drawn. Again, the house-fly, in helping itself to a knot of sugar, first renders the sugar soluble by a flow of saliva.

Dipterous insects have a complete metamorphosis—that is, the adult female lays eggs from which come fleshy, legless maggots; these on being full fed pass into a resting or pupa stage, during which the changes take place which result in the completion of the development of the future issuing adult.

While in most Diptera eggs are laid to the outside, which hatch into maggots, there are some exceptions, and among these may be mentioned the flesh-fly, the ked, and the forest-fly.

In the order Diptera the habit of life as imago or larva is very varied. Some disgust us by the way they revel in filth, so that their good work as scavengers is apt to be forgotten. The adult mosquito and gad-flies attack man and other animals; the robber-flies prey on other flies. The larvæ of the gnats and the blood-worms (the larvæ of chironomus) live in water; the rat-tailed maggots of the drone-fly in pools where rotting or decaying organic matter is present, sometimes in the liquid putrescent matter of a rotting animal. The larvæ of the daddy-long-legs, the pear-midge, and the onion-fly are well-known enemies of the agriculturist and fruit-grower.

Nor are useful predaceous forms wanting. I have taken from noxious caterpillars which they were devouring, the larvæ of Tachina flies, and often have bred out from the cocoons of the moths the mature Tachina. Every one interested in plants and troubled with green-fly should know the useful hover-flies, which unfortunately are too often regarded as harmful. Last summer I kept a number of the hover-fly maggots in captivity, and none doubted the maggots' usefulness who witnessed the savage greed with which they sucked dry the green-flies which I collected from rose-bushes and other plants and offered them as food.

Classification of Diptera.

There is a number of different classifications of this order, but the classification of Diptera is in a transition stage. For our purpose we will adopt Brauer's, and choosing out the families which contain animal parasites, we get the following list:—

I. Flies in which the pupa escapes from the larval skin through a T-shaped opening.

A. Long-horned flies, the antennæ having more than 6 joints.
Family *Culicidæ*—The Gnats.

B. Short-horned flies, antennæ 3-jointed.
Family *Tabanidæ*—The Gad-flies.

II. Flies in which the pupa escapes from the larval skin through a circular hole.

Family *Œstridæ*—The Bot-flies.
" *Muscidæ*—House-fly, Bluebottle, &c.
" *Hippoboscidæ*—The Louse-flies—*e.g.*, the Ked and Forest-fly.

Taking the families in order, we begin with the

Pulicidæ or Fleas.

Entomologists have been somewhat puzzled as to where exactly in the world of insects the Fleas should be placed. By some they have been made to form an order by themselves under the name of Aphaniptera or Wingless insects, but recent scientific opinion tends to look on the fleas as perhaps a degraded dipterous family, and we will take this view here.

The family Pulicidæ is made up of insects whose wings remain as mere scales. Their metamorphosis is complete. We are concerned only with one genus of the family, the genus Pulex, of which the following four species may be noted and distinguished:—

No comb-like spines on head or prothorax. *Pulex irritans* (L.), the flea of man.

No comb-like spines on head, 24 to 26 comb-like spines on the prothorax. *Pulex avium* (Tasch.), the flea of fowl and pigeon.

Seven to nine comb-like spines on lower edge of each side of head and on the sides of the posterior edge of the prothorax. Head rounded. *Pulex serraticeps* (G.), the dog-flea.

Five to six comb-like spines on lower edge of each side of head. Six spines on each side of prothorax. Head angular. *Pulex goniocephalus* (Tasch.), the rabbit and hare flea.

We may take *Pulex irritans* to illustrate the structure and round of life of the genus.

This lively, reddish-brown, laterally compressed insect has a small round head followed by a thorax bearing the legs, and a larger abdomen. Both thorax and abdomen have bristles. The head carries two simple eyes, a pair of very small antennæ, and the mouth-parts, which are modified to form a piercing and sucking organ. The six bristly legs, the last pair being the longest, end in claws and are characterised by the unusual size of the coxæ (the part which joints the leg on to the thorax).

The males are smaller than the females and have the end of the abdomen tipped up. The females lay their oval grey-coloured eggs in dusty corners, cracks in the floor, on mats, &c., &c. From these hatch out legless maggots, whose body is made up of 13 segments. If these larvæ be watched with a lens or under the microscope they will be seen to wriggle about very actively, doubtless assisted in their movements by the hairs present on each segment and by the two hooks at the tail end. After twelve days in the larval stage, the maggots, whose food has been animal or plant *débris* found in the sweepings, make for themselves little silken cocoons, which may be covered with dust particles. After a pupal stage of eleven to sixteen days, during which the changes take place that result in the complete development of the adult insect, the perfect flea emerges. The times of the different stages noted above are those given by Westwood, but these vary according to the climate and season.

Although fleas live on a blood diet, there is evidence that they are able to live and propagate for some time in absence of hosts. Thus Hudson in the 'Naturalist in the La Plata,' among other examples, mentions a hamlet raided and depopulated by the Indians twenty months before his visit, "and yet," he goes on to say, "on entering one of the deserted huts I found the floor literally swarming with fleas, and in less than ten seconds my legs to the height of my knees were almost black with their numbers." Most writers call the flea pugnacious, and contests between flea and flea have been described. On occasions, however, they unite against a common enemy. Henri Rochefort, while a prisoner in the citadel of Oleron, witnessed a pitched battle between two squadrons of fleas and bugs, when, "after a few minutes' battle, the latter were reduced to mere skeletons fit to figure in a naturalist's museum."

THE DOG-FLEA.

Pulex serraticeps is pale red-brown in colour. The male (fig. 46) is 2 mm. long and the female 3 mm. The spines mentioned in the preceding table are very characteristic. Curious are the little antennæ enclosed in pits behind the eyes under cover of a plate of chitin; they easily escape notice.

This flea also can pass to the cat. Neumann says it seldom pricks man, but observations in the Eastern United States prove conclusively that there *P. serraticeps* and not *P. irritans* is the commonest form, dwelling in the houses and attacking the inmates.

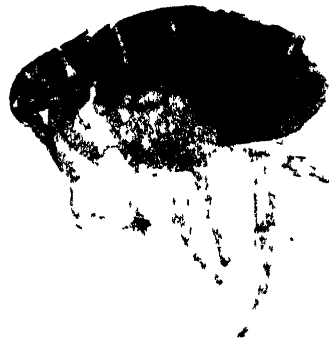

Fig. 46.—Dog Flea. Male, much magnified. (Original.)

The eggs are laid among the hairs of the dog or are dropped to the ground, where they hatch. Simmons, working in Calcutta, found the eggs to hatch in two days, the larval life to last for seven days and the imago to issue from the pupal case in eight days more, the whole development from adult to adult being completed in seventeen days. A similar rapid development is confirmed from Washington from experiments made in the Entomological Department in the summer of 1895. The time will lengthen according to the environment.

The old belief was that the larvæ fed on dried blood which had been disgorged by the mother flea for the purpose. Such devotion to the young would not be without parallel in the insect world, but the truth seems to be that these blood-pellets are really the excrement of the adults, which, lying about among the eggs and attached to them, provide nourishment sufficient for the larvæ. Waste matters found in the dust amongst which the larvæ live are also used.

It is not impossible for the whole life-history to be completed on the host, the larvæ living on the scurf. Austen and Leuckart quote instances in proof, in the case of dogs suffering from skin eruptions; while in the material combed from an infested dog I have found many flea larvæ. Neumann testifies to the same possibility as regards the cat.

PULEX AVIUM.

This species has an elongated body and a round smooth head lacking the comb-like spines. It attacks a number of birds. Its chief interest for us is that it attacks the pigeon and fowl (where it may be got by putting the hand into the nest). Among other hosts Theobald[1] records it from the thrush, robin, and nest of blackbird.

It can prick man. Sitting hens are annoyed, and where the fleas abound growth of the young birds is interfered with.

Treatment for Fleas.

We have seen in the life-histories how the larvæ develop in dusty corners and crevices. Hence let there be a careful and regular sweeping, and a periodical cleansing out of dog-kennel and hen-house with lime-wash, care being taken that all the corners get a supply.

As against the adults, infested dogs, having first been bathed with soapy water so that the powder will stick, should be sprinkled with fresh pyrethrum powder, and similarly fowls.

Benzine sprinkled about an infested place drives away fleas. If benzine be used it must be remembered that it is very inflammable, and no fire must be present. Creolinated water—a 10-per-cent solution—is an excellent wash for flea-infested animals, while a strength of 5 per cent makes an excellent disinfectant.

The use of pine-wood chips or fine shavings for the nests of birds, instead of straw, has been recommended, the resinous odour being noxious to the pests. Railliet, however, throws doubt on the success of this measure.

A little sawdust soaked in naphthalin and placed in the nests of sitting birds will give them peace. It is a common practice in museums to place small unstoppered phials containing naphthalin in the corners of the cases that hold insect and other collections, so that the fumes from the naphthalin may kill any insects that might enter to destroy the collections.

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[1] An Account of British Flies, by Fred. V. Theobald. 1892.

Another very excellent insecticide is bisulphide of carbon, and some recommend the placing of a little of it in a dish in a corner of, say, a hen-house where it would not be knocked over. The vapour of the carbon bisulphide would be almost immediately fatal to any insect vermin. There are two drawbacks to its use. Bisulphide of carbon has an extremely disagreeable odour, and great care must be taken not to bring a light near it—the person using it must not even be smoking at the time.

If fleas have their special likings—viz., children and women and people with delicate skins—they have also their prejudices, and Railliet mentions as one the odour of the horse, so that grooms and "dwellers in stables" possess immunity from fleas; hence the custom of placing a horse-cloth in a corner so as to drive away the pests.

A very original method of flea-trapping was that practised by a professor in Cornell University. The lower part of one of the Halls was badly infested, and the professor's plan of combating the inroad is thus chronicled in vol. vii. of 'Insect Life': "He had the negro janitor put on a pair of rubber boots, and then tied sheets of sticky fly-paper, with the sticky side outward, around the legs of the boots. The janitor was then told to patrol the lower floor for several hours a-day. The result was gratifying and rather surprising. The sheets of fly-paper soon became black with fleas and had to be changed at intervals, but by this means the building was almost completely rid of the pest, with a minimum of trouble to every one except the janitor."

In Southern Mexico there grows a plant called *Asclepias curassivica* which the Indians use as a deterrent for vermin. The walls and floors are swept by brooms made of it, and fleas are thereby driven away for a considerable time. So, too, the "sweeping down" of a flea-infested dog is followed by the rapid flight of the vermin.

The Culicidæ or Gnats.

This family of long-legged, narrow-winged insects, with handsome antennæ, is familiar to us through the common gnat, which can be so troublesome, although not so annoying, as the mosquitoes or gnats of other countries. The females settling on any exposed part of the body pierce the skin by means of certain of their mouth-parts, which have the form of delicate lancets with barb-like teeth at their tip. The blood is then sucked up by means of a tube. When not in use the lancets and styles are carried in a sheath, which is really the modified lower lip of the insect. The males are harmless, living on the nectar of flowers.

The life-history of the gnat is interesting. Its eggs are laid in quiet or stagnant pools or in water-butts, these cone-shaped eggs, to the number it may be of 300, being glued together into little packets, which, if submerged, will immediately come to the surface again, and which always right themselves if turned upside down. Ultimately the larvæ push themselves through the bottoms of the eggs and live in the water on vegetable matter. The larvæ wriggle about in the water or hang head downwards, taking in air by means of a little roundish projection at the tail-end, which projection reaches the surface of the water. The air taken in here passes all along the body by means of air-tubes. When later the larva becomes a pupa this position is reversed, the swollen anterior end of the pupa being uppermost, with two little horns projecting from the back of the head, by means of which respiration proceeds. In a short time the skin of the pupa on the surface of the water splits along the back, and the adult gnat, drawing out head, legs, and abdomen, floats for a short time on the empty pupa-case till its wings have dried, when it flies away.

Professor J. B. Smith, of New Jersey, in his 'Economic Entomology,' recommends a mixture which, rubbed over exposed parts, will keep off mosquitoes for two hours or longer without renewal, and trial might be made of it when gnats happen to be specially troublesome, as they are apt to be in very hot seasons. The mixture is—

Oil of penny-royal	1 part.
Oil of tar	2 parts.
Olive-oil	2 "

The Tabanidæ or Gad-flies.

These are middle-sized or large-sized insects, with stout compact bodies. The eyes are large and prominent, quite meeting on the top of the head in the males, with a little separation between them in the females. The third joint of the antennæ is ringed. The six lancets of the female mouth form a most formidable piercing apparatus, a wound being made and blood drawn from man or beast with great ease. Persons attacked vary much in the response they give. Once insect-hunting with a friend in a district where these flies abounded, both of us were "stung" frequently (wherever a dipterous insect is spoken of as "stinging," this never means by an organ at the end of the body as in the bees and wasps, but always by the mouth-parts) on wrist and neck; but while one of us did not suffer more than the temporary pain due to the pricking of the wound, the other showed swellings and had a smarting and itching sensation for a considerable time. Attacked animals, wounded and in a state of panic, rush about, and besides the harm and loss which may result from this there is always the possibility of some disease being communicated by the introduction into the blood of some harmful germ.

Male Tabanidæ, as with the gnat, are characterised by their quiet and more modest demeanour; their mouth-parts are neither so numerous nor so formidable as in the females, and their food is found in their visits to flowers.

The legs are strong, and on the tarsi are three cushions. The adults frequent pastures and wooded places and marshy ground, flying about most actively in the heat of the sun; some of them make a loud buzzing noise in their flight, which has earned for them the name of Breeze-flies.

The life of the spindle-shaped larvæ seems to vary. These may be found in the soil living on humus or on a carnivorous diet, or more rarely they may be found in watery places. The pupa has six little processes at the hinder end.

Three Gad-fly genera fall to be noticed by us.

TABANUS BOVINUS, THE OX GAD-FLY (FIG. 47).

This is one of our largest Diptera, measuring it may be an inch in length and having a stout body. The compound eyes, each possessing hundreds of facets, are very prominent. The brown-black thorax is hairy and has dark stripes; the reddish-brown abdomen has a very characteristic longitudinal row of whitish triangles along the middle of its dorsal surface. The flatter female can be distinguished by the large eyes not meeting on the top of the head.

The eggs seem to be laid on the earth, into which the legless maggot passes to feed on decaying matter or to gnaw the roots of plants. The diet of grub and adult are thus seen to be very different, the former taking solid food and the latter blood. The difference of mouth-parts in imago and grub is met with, however, in other orders of insects—*e.g.*, the Moths and Butterflies, which as imagines take honey by a sucking-tube while their caterpillars have biting jaws.

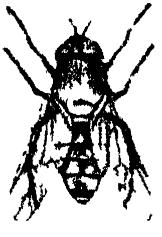
Fig. 47.—The Ox Gad-fly. Male, natural size. (Original.)

The Tabanus maggot is thus described by De Geer, quoted by Westwood: "It is of an elongated sub-cylindric form, attenuated at each end, especially in front; it is destitute of feet, 12-jointed, having head distinct, narrow, elongated, horny, armed with two strong curved hooks, antennæ, and palpi; the fourth to the tenth segments having an elongated dorsal papillose ridge used in progression; the terminal segment is minute and tuberculiform."

When full fed the maggot becomes a pupa in the soil, and this, when the fly is ready to issue, works its way to the surface and half-way out of the ground by means of the spines present on it (just as the daddy-long-legs pupa does), escaping by a rupture at one end.

The adult insects fly from the end of May onwards.

HÆMATOPOTA PLUVIALIS, THE CLEG OR HORSE BREEZE-FLY.

This common and well-known pest of the horse (fig. 48), whose blood the female draws for food (*Hæmatopota* means blood-drinker), also attacks man,—the attack possibly being followed by a swelling.

The cleg, which flies in late summer, though resembling the last fly in its method of work, is very different in appearance. It measures about half an inch long and is narrow. There are longitudinal pale stripes on the thorax, and the abdomen has on its upper surface a pale band and greyish spots. The wings are grey with light-coloured markings. In the living insect the eyes are very beautiful—green, with it may be coloured bands across them or a purplish reflection.

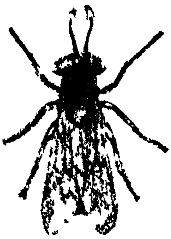
Fig 48.—The Cleg, enlarged. (Original.)

The larvæ live in the soil.

Every one is familiar with the little frothy spittle-like collections found sticking to grass and other herbage. If such so-called witches' spittle, or cuckoo-spit, or frog-spit be examined, an immature insect will be found imbedded in it. There is a belief in certain places that the cleg comes from this, and I have more than once been asked if this be so. The insect which develops in the froth has nothing to do with the cleg, but is one of the frog-hoppers which live on plants, leaping about with great activity. The frog-hoppers are not dipterous insects, but belong to the Hemiptera.

CHRYSOPS, THE BLINDING BREEZE-FLY.

This genus is distinguished at once from the last by the presence of three little simple eyes or ocelli on the top of the head. The large, handsome, compound eyes are golden-green, with purple lines and spots.

There are two species in Britain—*Chrysops cæcutiens* and *C. relictus*, which are somewhat like one another.

C. cæcutiens, the Blinding Breeze-fly (fig. 49), so called from the preference it shows, when attacking animals, for the parts round the eyes, measures from one-third of an inch to a little over this. Its abdomen is somewhat flattened and somewhat square shaped. When in a state of rest the wings are held somewhat apart. These are dark coloured, with a clear light mark about the middle and a smaller one farther back. The metamorphosis is not known, but the larva, as in the other Tabanidæ, is supposed to live in the ground.

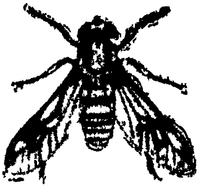
Fig. 49.—*Chrysops cæcutiens*, twice natural size. (Original.)

Protection against these Tabanidæ is difficult. As a salve for wounds ammonia salts can be recommended. To ward off attack in absence of a net or some such covering, one could dress with some deterrent mixture—*e.g.*, fish-oil and crude carbolic acid.

The Œstridæ or Bot-flies.

This is a family of generally large hairy flies whose mouth-parts are either quite abortive or rudimentary, so that as adults they do not feed. The head is large and the face broad; the small 3-jointed antennæ are in grooves; the third joint carries a dorsal bristle. The males have a rounded and the females a pointed abdomen. Some species bring forth live maggots, others lay eggs. The legless larvæ are 12-jointed including the head, and may be warty with rows of spines. At the posterior extremity the respiratory organs open, the stigmata or spiracles being situated on plates. Three stages are distinguished in the course of larval life, corresponding to and determined by two moultings. The pupal stage is passed under cover of the last larval skin, from which the imago escapes by a rupture at one end, caused by pressure from a little projection on the insect's head.

The Œstridæ proper fall into three very natural sub-families, in which not only can a distinction be drawn between the adults and the larvæ respectively, but the biology is also distinct. The sub-families are—

(1) The *Cuticolæ*, where the larvæ live beneath the skin.

(2) The *Gastricolæ*, with the larvæ resident in the alimentary canal.

(3) The *Cavicolæ*, where the larvæ crawl up the nostrils to the frontal sinuses.

Of each of these three we will take a type—viz., of (1) the Ox Warble-fly, of (2) the Horse Bot-fly, and of (3) the Sheep's Nostril Fly.

HYPODERMA BOVIS (*De Geer*), THE OX WARBLE OR OX BOT-FLY.

The genus Hypoderma consists of long-legged hairy flies, with head broader than the thorax. The antennæ are very short. The proboscis is rudimentary. The females possess an ovipositor of several segments which can be telescoped within one another. The larvæ pass through several stages in which they show change in shape, in mouth-parts, and in armature.

In Europe, *Hypoderma Actæon* (Brau.) attacks the red-deer, *H. Diana* (Brau.) the roe-deer and the red-deer, and *H. Tarandi* (Brau.) the reindeer, while *H. bovis* and *H. lineata* (Villers) attack cattle.

H. bovis, the Ox Warble or Ox Bot-fly (fig. 50), whose maggots are the cause every year in Britain of a loss of many thousands, or perhaps we should say of some millions, of pounds, is a hairy two-winged fly, measuring over half an inch in length. It is dark coloured, banded with yellow hairs. There are yellow hairs on the face, yellow and black hairs on the thorax, while the hairs on the abdomen are yellow-red posteriorly, black in the middle, and yellow-white in front.

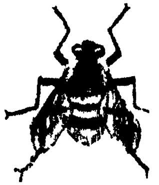

Fig. 50.—*Hypoderma bovis*, natural size. (Original.)

The flies, which appear in the summer, but are most common about July and August, lay their eggs on the upper parts of the body of the ox, along the back or flanks or sides. The eggs have a little stalk whose base is swollen into two lobes or lips, as Riley describes them, "with a groove between them, closing over the hair," and forming an excellent arrangement for fixation.

From this structure of the egg, and from the shape of the blunt ovipositor, it is regarded as certain that the hide is not pierced in egg-laying, but that the maggot, hatched in the open, makes a passage for itself. We will see later that there is a difference of opinion as to the "road" by which the maggot travels ere it takes up its position in the "warble-cell"; but Miss Ormerod, from a section made at an early stage of infestation, believes that the maggot, aided by mouth-hooks and spines, makes its way directly through the hide: Miss Ormerod's section showed a delicate passage leading from the external surface to the at-the-stage-of-examination very small maggot.

The maggot develops slowly during the autumn and winter, until in February or March of the next year lumps can be felt and an opening in their centre begins to show, this opening being the external end of the passage which leads to the warble-cell below the skin. Meanwhile the larva continues to grow, feeding on the pus and blood from the ulceration which the irritation of the maggot's presence has given rise to. Some of the pus may exude from the external opening and mat together the surrounding hairs.

With growth and moulting the maggot passes from a worm-shaped creature to a club- and pear-shaped form (fig. 51), in the course of which changes the mouth-hooks, present in the very youngest stage, seem to be lost, the bands of prickles show a different arrangement, the spiracles at the tail-end become more prominent, and the general colour of the larva changes from white to greyish or greyish-brown.

The grown wrinkled grubs, with transverse bands of prickles, feed with the anal end, containing the spiracles, uppermost, and on being full fed, when they measure about an inch, they leave the "warble-cell," generally early in the morning (as Reaumur and others since have shown), by squeezing themselves out of the tumour tail-end foremost. Having fallen to the ground, the larva wriggles to some sheltered place or goes a little into the ground and becomes a pupa (fig. 52), the external covering of which is black. In a month or more, according to the season, the fly emerges.

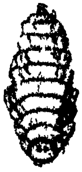
Fig 51.—Larva of *Hypoderma bovis.* (Original.)

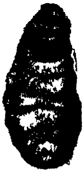
Fig 52.—Pupa of *Hypoderma bovis.* (Original.)

The ox warble-fly causes immense loss in various ways.

In the first place, it seems to be fairly well agreed that the presence of the flies bent on egg-laying is a source of great alarm to the cattle (although it is certain that *H. bovis* is sometimes blamed for panic really due to the Tabanidæ), which gallop about and run the flesh from their bones.

This galloping is specially bad for milk-cows, not only because it affects adversely the quality and quantity of the milk, but also because the udders get bruised by striking against the body as they swing from side to side during the headlong flight of the cows. Mr Harry Thompson of Aspatria, a well-known authority on this subject, informed me recently, in conversation about the matter, that he has often been witness to this harm, that bruised udder brings the flesh off the cow terribly, and that not rarely gangrene follows, ending in septic poisoning and death of the cow.

Again, the cattle, owing to the irritation caused by spiny and feeding grubs under their skin, cannot feed at peace, and as they fail to put on flesh the owner does not get a return in keeping with the feed.

Still further, after the cattle have been slaughtered, there is more loss in dressing the carcasses from what has been called "licked beef" or "butcher's jelly." Discussing this subject on page 20 of her work on the Warble-fly, Miss Ormerod quotes Mr Harry Thompson thus: "What causes the damaged meat or beef is the chronic inflammation set up by the warbles in the skin, which extends to the connective tissues, thence to the flesh, producing the straw-coloured, jelly-like appearance of a new-slaughtered carcass of beef, which in twelve to twenty-four hours, when exposed to the air, turns a dirty greenish-yellow colour; and this spoils the beef, having a frothy discharge oozing from the surface, with a soapy-like look."

Again, Miss Ormerod quotes Mr John Child, of the Leeds and District Hide, Skin, and Fat Co.: "In the worst part of the warble season I could get bucketfuls of inflamed tissue, commonly called by the butchers 'jelly,' cut and scraped from the carcass after the hide is taken off. The formation of this matter must be a great drain on the health, condition, and quality of the animal, and must be a great loss to somebody."

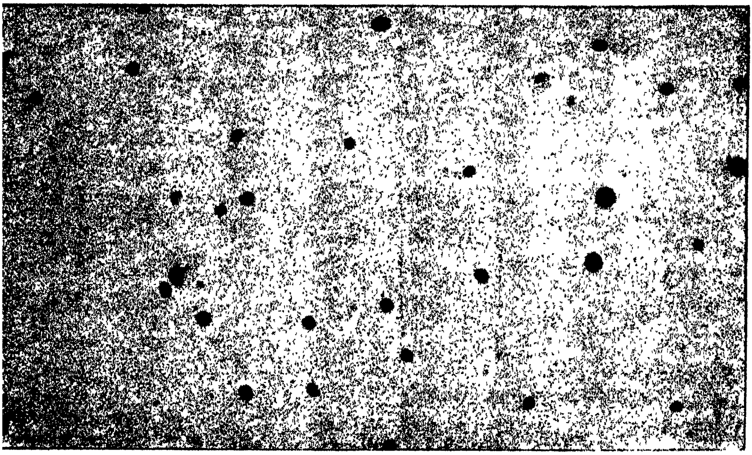

Fig. 53.—Piece of hide of Ox after tanning, showing the warble-holes, natural size. (Original.)

Lastly, there is the grievous loss from hides ruined for tanning purposes. Sometimes the hides are quite riddled with warble-holes. Miss Ormerod mentions several cases where as many as four hundred holes were present; and in one of my own specimens, measuring 21 inches long by about 9½ inches broad, a part of which is shown in fig. 53, I counted not less than 236 holes. Smaller numbers are of course commoner.

Means of Prevention and Remedy.

Where sheds or some such shelters are provided or present, cattle will suffer less than those exposed in the open with no such places to retire to when the flies are about.

The flies are also said not to cross water in search of a host.

For dressing the animals' backs so as to disgust the fly and prevent her from egg-laying, fats and oils have been recommended by all the old writers, even back to the time of Pliny. Good dressings for such a purpose are train-oil and Stockholm tar. A favourite recipe of Mr Harry Thompson's is "flowers of sulphur 4 oz., spirits of tar 1 gill, train-oil 1 quart. Mix well together, and apply along the spine once a-week with a small brush." Animals so dressed graze in peace, while alongside of them beasts not treated are careering about the fields.

Once the cattle are infested, the likeliest time to succeed against the pest is in the spring, when the warbles are opening. The maggot, as has been already pointed out, breathes by spiracles situated at the tail-end, and as it lies tail-end uppermost and at the opening, any sticky or greasy substance placed on this will choke up the breathing-pores and suffocate the maggot. M'Dougall's sheep dip, lard, a mixture of cart-grease and sulphur, or tar-oil and sulphur, are all effective for the purpose.

A poisonous material is mercurial ointment, a little of which (only a little in case of accident) is dressed on to each warble and soon kills the maggot. Miss Ormerod has had many communications testifying to the complete efficacy of this last method of treatment. The difficulty is not to kill the larva, but to get people to take the trouble to do it.

Squeezing out the maggots (and killing them), which may be done without difficulty about the time they are ripe, is a practised and thoroughly useful measure.

Altogether, in view of the comparative ease with which *H. bovis* can be successfully warred against, there is little excuse for the widespread loss occasioned by it.

HYPODERMA LINEATA (*Villers*), THE STRIPED OX WARBLE-FLY.

For long it was believed that the species of ox bot-fly injurious to cattle in America was also *Hypoderma bovis*, but comparatively recently very careful observations and examination of bred-out specimens have proved that the pest in America is *H. lineata*.

H. lineata is also a European and a British fly, but any warble infestation with us has always been ascribed to *bovis*.

The two flies, *bovis* and *lineata*, resemble each other extremely closely; but generally it may be said that *lineata* is smaller and shows longitudinal bands on the front part of the thorax, light stripes alternating with dark—hence one name, the Striped Ox Bot-fly.

The great interest, however, of *lineata* is its life-history, which has been placed beyond doubt by several workers in America, among whom Dr Curtis occupies a prominent place, as chronicled by the late Mr Riley in his article on *H. lineata* in the June number of 'Insect Life' for 1892.

As expounded by the late Mr Riley, the eggs of *lineata* are laid in rows on the hairs, to which they are attached in a manner similar to that described under *bovis*. The eggs are laid on places that the cattle can reach conveniently with their tongues, a very favourite place being "the legs round about the heels,"—hence also another name for *lineata*, the Heel Fly.

The cattle, in licking themselves, convey the hatched maggots to their mouths, and these young maggots, which are spiny, thereby are able to attach themselves to the gullet. After moulting (in this first moult the larva loses its spines) the now smooth maggot proceeds to wander from the gullet through the tissues to the back, under the skin of which they are, after a number of months' wandering, found. Here a second moult takes place, which leaves the larva once more spiny. They then bore through to the exterior, tail foremost, and after a third moult assume the form familiar to those who know the appearance of *bovis* in its last stage. The rest of the life-history is as in *bovis*.

From the eminence of the various observers in America, and from the evidence they adduce, it seems impossible to doubt that the above is the true life-history of *lineata*. Two questions naturally arise out of this—namely, Is it possible that our *bovis* has a similar life-history, and how is it we never have complaints of *lineata* in our country? I have pointed out earlier that Miss Ormerod, who has identified herself in so splendid a manner with the ox-warble infestation in our country, does not believe in the "wandering" of *bovis*. There is still room for evidence, however, and for additional observations as to possible *lineata* attack; and if I here invite attention to the subject, and invite communication should eggs be found on the legs of the ox or presence of larvæ in the ox's gullet, it is not with any intention of overlapping the work of Miss Ormerod, who has made this subject peculiarly her own and has already issued an appeal for further information, but solely with a view to seconding her appeal.

GASTROPHILUS, THE HORSE BOT-FLIES.

The genus Gastrophilus contains middle-sized silky-haired flies with a distinct channel on the face between the eyes. The larval stage is passed somewhere in the alimentary canal of the host. With us the best-known species are *Gastrophilus equi* (fig. 54) and *Gastrophilus hæmorrhoidalis.*

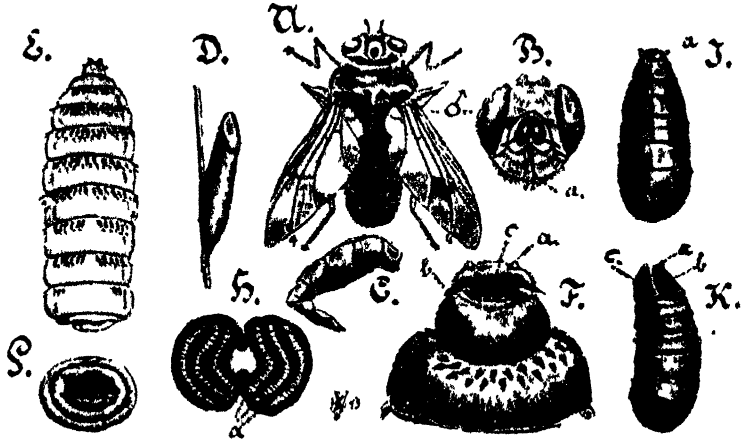

Fig. 54.—*Gastrophilus equi.*

A, Male, twice natural size
B, Head of same, with *a*, the channel on the face.
C, Abdomen of female, showing ovipositor.
D, Egg on a hair, magnified
E, Grown larva, magnified.
F, Front end of larva *a*, antennæ; *b* and *c*, mouth-hooks, much magnified.
G, Last segment of larva seen from behind.
H, Stigmatic plates at hind end of larva, greatly magnified.
I, Pupa.
K, Pupa seen from the side.

(A to D after Brauer, E to K after Nitzsch)

Gastrophilus equi (Fabr.), *the Horse-bot or Horse-bee,*

is a yellowish-brown fly, measuring from a half to two-thirds of an inch long. It is a hairy fly, the hairs on the dark-banded thorax being reddish, those on the abdomen yellow-brown. The male has the end of the abdomen rounded, while that of the female is pointed from the well-marked ovipositor, which is directed downwards and forwards.

The whitish-yellow eggs, one-twelfth of an inch long, are pointed at the end attached to the hair of the horse, and truncate at the free end from which the maggot will issue; examined closely they show a transverse striation (fig. 55). The newly-hatched maggots are spindle-shaped. Each has at the anterior end two little antennæ, mouth-hooks, and a series of spines. The hind edges of the segments that follow the head also carry prickles, save the last two.

The grown larva, three-quarters of an inch long, is somewhat convex above and truncate posteriorly; in addition to the hooks round the mouth-end, each segment following the head has a double row of prickles, less marked on the posterior segments. On the hind surface of the last segment the spiracles are seen.

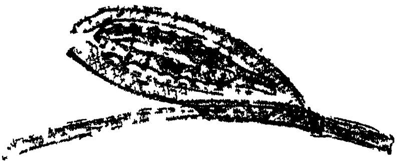
Fig. 55.—Egg of *Gastrophilus equi* attached to hair of horse, and showing larva in situ, much magnified. (Original.)

The life-history is as follows: The females in the summer — perhaps most commonly in July and August—glue their eggs to the hairs of the horse on the forelegs and shoulder region. The eggs hatch in times varying from some days up to some weeks; they are sensitive to warmth and moisture, one observer stating that he obtained hatching at pleasure by exhaling his hot breath on them.

The maggots, to escape, push off a lid at one end of the egg, and either protrude their bodies without entirely leaving the egg for a time, or leave it and crawl on to the horse's skin, where a tickling is caused by their wriggling. In either case, the active larvæ (their activity can be well seen by placing larvæ for examination in a drop of horse's saliva) are conveyed to the mouth by the horse licking itself, any out of convenient reach perhaps serving for a companion. The maggots ultimately reach the stomach, to the first half or cardiac end of which (I have also seen them in the second half of the stomach, but this is not common) they fix themselves by their mouth-hooks, which they bury in the mucous membrane (fig. 56).

In this position, nourished, as Neumann says, "on the inflammatory products secreted by the small wound in the mucous membrane," they remain till full fed, when, after a stay of nine or ten months, they let go their hold, and passing through the alimentary tract, reach the ground in the fæces. In the ground the pupal stage is passed under cover of the last moulted larval skin, which becomes quite dark in colour. The fly emerges in five or six weeks.

Another fly resembling *G. equi*, but smaller and darker, is *G. hæmorrhoidalis* (Linn.) It also lays darker eggs on the hairs of the horse, sometimes on the long hairs about the lips, and these being licked, the maggots are conveyed to the mouth. Other points of difference in the biology are—the maggots of *hæmorrhoidalis* often fix themselves in the pharynx and back of the throat, interfering with swallowing; and another favourite position for them is in the rectum, where the generally red-coloured larva takes on a green colour. In the rectum the maggots can be seen and felt.

Opinion differs a good deal as to the harmfulness of these bots. In conversations with veterinary surgeons, I find there is a tendency to minimise the evils that may attend bot-presence. There are authenticated records, however, which place the possibility of grievous harm beyond all doubt. Inflammation, ulcers, interference with digestion, interference with the free passage of food or exit of waste matters, loss of appetite and condition, have been frequently attested to.

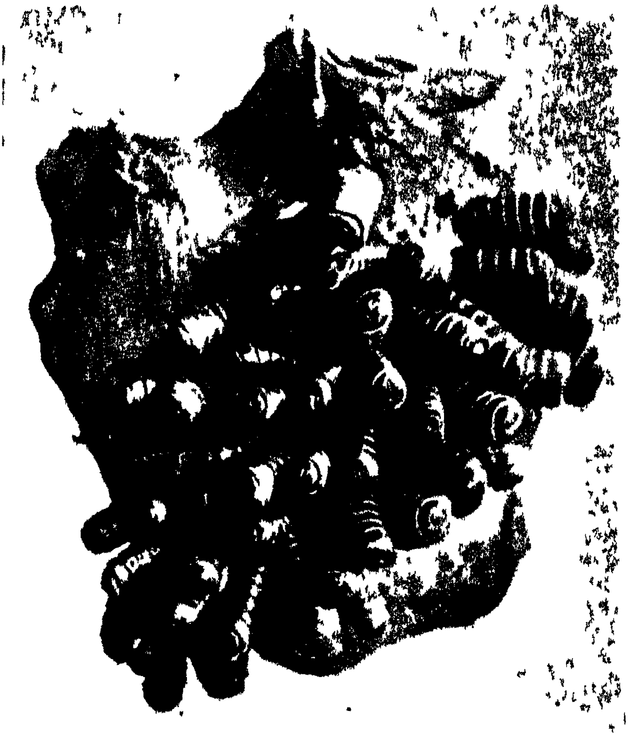

Fig. 56.—Larvæ of Horse-bot attached to Stomach, natural size. (Original.)

In connection with prevention and remedy, attention should be directed to the possible prevention of egg-laying by means of washes whose unpleasant odour would disgust the females, or at least the careful periodical examination of horses that have been out at grass, with a "grooming" thorough enough to remove the

The maggots of *hæmorrhoidalis* can be removed from the anal region and rectum by hand, those in the laryngeal region have been, by pushing into the throat a stick covered with cloth saturated with oil.

As against the maggots in the stomach, little success follows efforts to expel them by means of medicines. Mr H. Thompson recommends as medicine in cases where emaciation seems due to the presence of bots, 2 oz. turpentine and 20 oz. of raw linseed-oil, mixed and given as a draught once a fortnight.

That infested horses should be fed well goes without saying.

ŒSTRUS OVIS (*Linn.*), THE SHEEP'S NOSTRIL FLY.

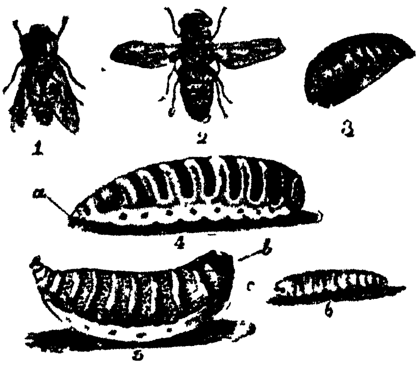

Fig. 57.—*Œstrus ovis.*

1 and 2, Adult fly.
6, Young larva.
3, Pupa.
a, Head end.
4 and 5, Full-grown larva.
b, Tail-end
(After Riley.)

This species (fig. 57), which is viviparous, depositing not eggs but maggots inside the rim of the sheep's nostril, causes what is known as "false gid" in sheep from one of the attendant symptoms. Occasionally a good deal of loss is caused by this attack; in the summer of 1896, for example, the flockmasters of Monmouthshire, Herefordshire, and adjacent districts suffered heavy losses from the nostril maggots.

The greyish-yellow fly, which measures about half an inch in length, has transparent glassy wings. The flies are described as lazy, and seldom flying except when engaged in laying their young.

The pest is worst in the summer and early autumn, when, tempted out by the sunshine, it circles round the sheep, darting in at them and depositing the maggots within the nostril. The maggot has three stages. To begin with it is very small and white, with spines on the under surface of the abdomen; in the second stage spines round the mouth and on the lower surface of the abdomen are well marked, as also are the stigmata on their plates. Later, the full-grown larva, white with dark streaks, measures about three-quarters of an inch long, and is convex on the upper surface; the head-end, furnished with hooks, is somewhat pointed, and the posterior end is truncate.

The maggots when deposited make their way up the nostrils, drawing themselves up by means of their hooks and spines, which, buried in the mucous membrane, cause much irritation. Later the maggots are to be found in the frontal sinuses of the head, and it may be the horns. The number of larvæ found on examination in a single sheep varies from three or four up to many, but the lesser numbers are the more common (fig. 58).

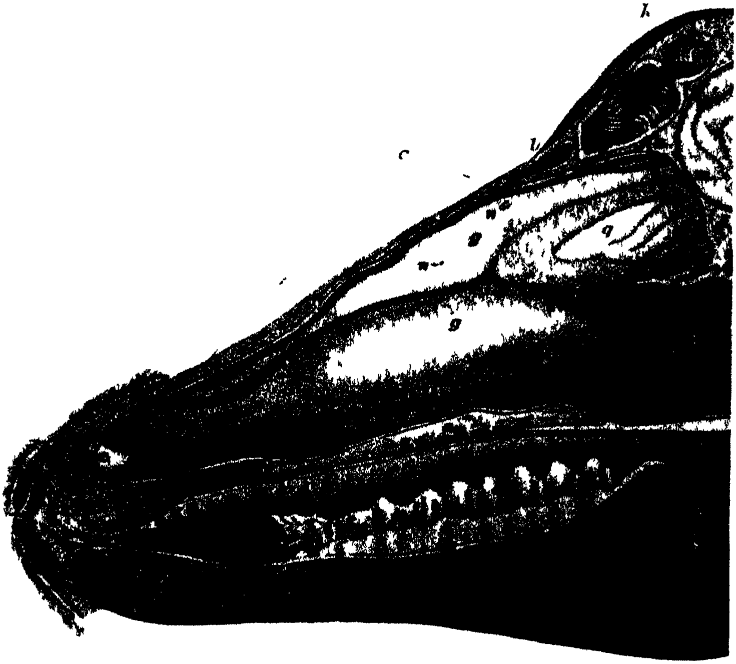

Fig 58 —Mesial section of Sheep's head invaded by *Œstrus larvæ*

c, The nasal cavity
d, Lower jawbone
e, Nostril
f, Opening of tear duct

g, Turbinated bones
k, Frontal sinus, 3 larva in it
l, Nasal sinus

m, Cribriform plate
n, Larvæ ascending the nares
i, Larva ascending to the sinus

(From Curtis)

Full-fed, the maggots—unless imprisoned in some recess from which owing to their increased size they are unable to return—reach the nostrils again and are sneezed out on to the ground, into which they pass and pupate. The larval life is said to last for nine or ten months, and the pupal stage a month or longer.

Dr Curtis has found in his experience larvæ of all sizes at the same time, and this goes to prove that the work of the fly is not limited to a restricted definite flight period, but that the flies issue from the pupal cases at different times and proceed to deposit their maggots whenever temperature and weather conditions are favourable. From my own experience with other insects I strongly favour this view.

How much the sheep dislike and fear their enemy is seen from their behaviour when the fly is about and at work. Bracy-Clark, writing in 1797 in the Linnæan Society's Transactions, gives the following description: "The moment the fly touches the nose of the sheep they shake their heads and strike the ground violently with their fore-feet. At the same time, holding their noses close to the earth, they run away, looking about them on every side to see if the fly pursues; they also smell to the grass as they go lest one should be lying in wait for them. If they observe one they gallop back or take some other direction. As they cannot, like the horses, take refuge in the water, they have recourse to a rut, dry dusty road, or gravel-pits, where they crowd together during the heat of the day, with their noses held close to the ground, which renders it difficult for the fly to get conveniently at the nostril."

Neumann, writing on the symptoms attending sheep-bot infestation, says: "The first sign of their presence is a discharge, at first clear and serous, then thick and mucous, from the nostrils. Then there are frequent sneezings and snortings, accompanied by the expulsion of the mucus, and sometimes of the larvæ. Later, the animals throw their head upwards, and rub their nose on the ground or with their fore-feet. As the malady progresses, the sheep hold their head low and lift their limbs high in movement as if walking in water."

From the sheep staggering, this disease is sometimes confused with "staggers." There is no connection whatever between the two. The well-known "staggers," in which the sheep turn in a circle, is due to the presence in the brain of the sheep of a large bladder containing the immature stage of one of the tapeworms, viz., *Tænia cœnurus*.

In combating *Œstrus ovis*, prevention is to be aimed at as more likely to be attended with useful results than later remedial measures. A preventive measure is smearing the noses of the sheep with tar or fish-oil, or some such stuff, which would deter the female from depositing her maggots. It is no wonder that such a suggestion has been found too onerous for those in charge of the sheep to carry out, and so there are contrivances for making the sheep dress themselves. One such contrivance is to have in the pastures some salting-troughs made in the shape of the letter V. Both sides of these are smeared with tar, which is rubbed against the noses of the sheep as they lick the salt.

Another plan is to turn up fresh furrows in the pastures, in which the sheep can bury their noses at will.

Remedial measures have for their object the stupefying of the maggots by fumigation, and their discharge consequent on violent sneezing of the sheep. For this purpose tobacco-smoke is blown up the nostril, or a mixture of equal parts of turpentine and olive-oil injected by a syringe whose nozzle has first been well pushed up the nostril. These methods, however, have little success behind them to encourage their being practised.

For valuable sheep, the surgical operation of trephining may be performed, the exposed maggots being picked out by a pair of forceps or killed by an injection of benzine diluted slightly with water.

On the Continent several species with similar habits attack deer. It was thought that none of the deer species were to be found in Britain; but some time ago I received from Mr Percy Grimshaw, F.E.S., a reprint of a short paper in the 'Annals of Scottish Natural History' for July 1895, in which Mr Grimshaw chronicles the receipt of two females of Œstrus, or *Cephenomyia rufibarbis*, which is there described. Both specimens were from Strathcarron, Ross-shire. This is the first record in Britain of this Cephenomyia, whose larvæ are found in the nostrils and throat of the red-deer.

Cephenomyia rufibarbis is a hairy fly, nearly three-quarters of an inch long, with a black head and bright tawny beard. The full-grown yellowish maggots measure fully an inch

The Muscidæ.

This is a very large family, embracing very many genera and species which may appear very unlike one another. The characteristics of the family are three-jointed antennæ, with the third joint the largest, and with a dorsal bristle springing from it. The proboscis ends in two soft lobes, and has within it two bristles. The larvæ are legless maggots, with a pointed head-end possessing hooks, and a blunt tail-end. Their food may be living, or dead decaying, animals or plants. Pupation takes place inside the last larval skin, which hardens into a protecting case.

MUSCA DOMESTICA (*De Geer*), THE HOUSE-FLY.

A very familiar member of this family is *Musca domestica*, sometimes such a nuisance in our houses, and to stock also, with the irritating tickling caused by the movement of the flies over any exposed surface of the body. The mouth-parts are fitted for suction. The female flies lay up to 120 or more eggs, preferably in horse-manure. In a day or less these hatch. In a week or less the whitish maggots with pointed heads are ready to pupate. By another week the flies have emerged. The time taken for a complete cycle varies with the temperature. Recent experiments in America show that the whole life-cycle may take only ten days. There is thus ample room for a succession of generations during the summer and autumn.

All flies, however, called "house-flies," although taken for it, are not really *Musca domestica*. Among other species found in houses, and resembling very closely in appearance *M. domestica*, is a fly called Stomoxys. This genus may cause annoyance in house or stable or field by its piercing mouth-parts. Of two species, we may take as a type *Stomoxys calcitrans*.

Stomoxys calcitrans (Geoff.)—Fig. 59.

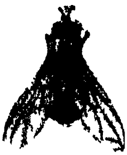

Fig. 59.—*Stomoxys calcitrans*, twice natural size. (Original.)

Literally the sharp-mouthed stinger that causes the horse to stamp, this is a somewhat shorter and stouter fly than *Musca domestica*. Its face has a yellowish tinge. The anterior part of the body is greyish, with dark lines and spots; the abdomen greyish-yellow brown. Wings glassy. Besides being shorter than the common house-fly, it can be distinguished in various other ways: the eyes are not quite so red; the wings when the fly is at rest are held wider apart; the head is held more erect when at rest, that of *M. domestica* being held down or withdrawn somewhat; and, best of all, the cruel proboscis, somewhat bent at its base, projecting in front of the head.

Stomoxys breeds in dung, and white maggots hatch from the eggs. The pupa is light brown, with two little black horns near the anterior end. The pupal stage, on the authority of Taschenberg, lasts four to six weeks. Stomoxys is found in the summer and autumn, when, flying on man or other animals, it pierces the skin in its quest for blood. The proboscis carries in a groove a fine sharp-pointed blade which can pierce through thin clothing.

In stables where these flies settle on the horses' legs the pricks of the proboscis cause the horses to stamp, and in sensitive fine-skinned animals a little swelling may follow the wound.

As this pest breeds in dung, the quick removal of this, or its destruction in some way, will do something to keep the flies in check.

For protection in stables, Taschenberg recommends a mixture of 120 grammes of Persian insect powder, 2 grammes of powdered sulphur, and 2 grammes lycopodium. These should be filled into a dry pig's bladder, which bladder is secured at one point round a let-in quill or some such little pipe. Through this pipe or quill, by pressure on the bladder, one squirts the mixture about the places where the flies settle in greatest numbers in the evening or on a cold day. This will kill the flies. Care must be taken that when not in use the bladder is thoroughly closed, else the odour of the mixture will go, and with it the effectiveness of the compound.

A dressing of fish-oil on the horses' legs might be resorted to if the flies were very troublesome in the stable.

There is also a practice of suspending in stables, by a string, branches of plants, on which the flies freely collect. At night-time the cord is snipped through, and the falling branch with its collection of resting flies caught in a sack held below for the purpose.

What was said under fleas as to the value of a thorough cleaning out and disinfection may be repeated here with reference to the stable, creolinated water in the lime-wash being very useful.

Not far removed from Stomoxys is the genus Hæmatobia, also blood-suckers. The species are smaller than the common house-fly, and have palpi much longer than those of Stomoxys. They live not under cover but in the open pastures, where they do their harm, and where, in freshly laid dung, the larval life is passed.

THE BLUE-BOTTLES OR MEAT-FLIES.

The Calliphora species have a proboscis fitted for suction, while the third joint of the antennæ is very long and carries a prominent feathery bristle. Two species of blue-bottle—*Calliphora vomitoria* (L.) (fig. 60) and *C. erythrocephala* (fig. 61)—are well known by their loud buzzing noise and their blue colour, and as laying their eggs on meat and fish or on matter beginning to decay, to which they are attracted by their very keen sense of smell.

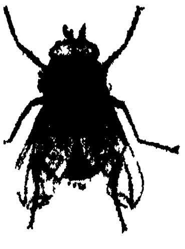

Fig. 60.—*Calliphora vomitoria.* Male, twice natural size. (Original.)

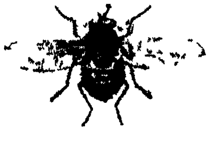

Fig. 61.—*Calliphora erythrocephala.* Female, natural size. (Original.)

The two flies resemble each other very closely in appearance, but on examination with a lens *vomitoria*, which is not quite so common as the other in houses, will be seen to have a black face and a red beard, while *erythrocephala* has a red face and a black beard.

The numerous eggs, which are much longer than broad, are laid in little heaps, and they hatch in twenty-four hours. The maggots, with horny hooks at the pointed mouth-end, and truncate posteriorly, are voracious, and in seven to twelve days, according to the temperature and the abundance of food, are full grown. The pupa is reddish brown, and this stage lasts ten to twenty days. Over-wintering may take place in the pupal condition, or the imago may over-winter in some sheltered retreat, to crawl out in the warmth of the next spring and proceed to reproduction.

These flies are mentioned here owing to a general belief that it is the blue-bottle which is the cause of "maggot" in sheep, whereas this is really the work of another fly, Lucilia, the green-bottle, to be mentioned presently.

The larvæ of blue-bottles and green-bottles are so like that any determination of the species from the larva is open to question; the maggots must be bred up to the imago stage in order to give certainty. There are many recorded cases of dipterous larvæ having been taken from the nose or ears or stomach, &c., of human beings, and among such larvæ *Calliphora vomitoria* is represented, as proved by breeding out the fly.

Incidentally I may mention here an interesting fact about these blue-bottles. I am at present working over the insects which are caught by the various insectivorous plants. One of these plants is Sarracenia, the trumpet-flower. In slitting open the tubular leaves of this plant in order to procure the enclosed insects—blue-bottles always being well represented—I have often found dipterous maggots in all stages of growth. It was clear to me that blue-bottles had been attracted to the Sarracenias by the smell from their imprisoned dead relations, and had crawled into the tubular leaf to lay their eggs in the putrefying heap of dead insects.

In order to make sure of the species, I took out from the Sarracenia leaves maggots seemingly full-grown and placed them by themselves. These maggots pupated, and the flies that issued proved to be *Calliphora erythrocephala*. Thus all of the numerous blue-bottles to be found at various times inside the Sarracenia trumpets have not walked in, but have been reared inside the prison from which they are unable to escape.

THE GREEN-BOTTLES.

The characters of the genus Lucilia are a soft proboscis, antennæ with third joint very long and carrying a feathery bristle. Abdomen short and rounded. Colour bright green. There are two species very closely resembling one another—viz., *Lucilia cæsar* (L.) and *L. sericata* (Meigen).

Lucilia cæsar (fig. 62) is green, with a whitish face, and the upper border of the buccal cavity reddish. First segment of abdomen blackish. Antennæ brown. Feet black. In the males the eyes almost meet on the top of the head.

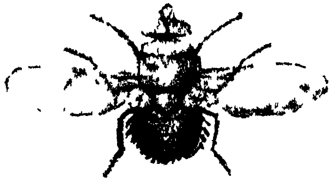

Fig. 62.—*Lucilia cæsar*. Male, twice natural size. (Original.)

L. sericata, smaller if anything, has both face and upper border of the buccal cavity white. The first two segments of the abdomen are blackish. There is a decided space between the eyes in the males. Colour also bright green, but associated with this is a bluish bloom absent in *cæsar*.

Both flies lay their eggs in putrefying matter, and they also lay in wounds.

Lucilia sericata,

which has been most observed, may be found flying about the sheep during hot weather, ever and anon sticking to the wool little clusters of white eggs, up to, it may be, as many as twenty in a cluster. Or the green-bottle may be seen coming from the wool if a sheep be caught. The earliest attacking flies choose for their egg-laying the anal region of the sheep, attracted by the odour of the fæces, some of which, especially in cases of diarrhœa, will have stained the wool in this region.

The wool here is also matted. By twenty-four hours the eggs have given exit to tiny maggots, which, to begin with, live in the filth, but soon, by means of their mouth-hooks, burrow into the skin. The maggots measure half an inch when full grown, which they are in a time varying according to the weather, of from a fortnight to twice as long. They drop to the ground, where the pupation stage is passed.

Since as many as five hundred eggs may be laid by a single female, and as the life-cycle is passed through quickly, there may be several generations during the season, with the consequent possibility of a wide attack.

Where the flies are plentiful egg-laying is not confined to the root of the tail, but may extend to shoulder, loins, sides, and belly. As the characteristics of attack may be noted the matting together of the wool-fibres; a continual wagging of the tail; the rubbing and biting and scratching of themselves by the sheep in their efforts to allay the irritation caused by the feeding maggots; much inflammation; an oozing from the places of attack of an evil-smelling sticky fluid; discoloration of the wool, which falls out and in bad cases does not grow on again.

Besides loss in this way, the sheep—and especially lambs, which suffer most—are worn out with the constant irritation, and become much emaciated.

Sometimes, too, the maggots are not content to feed towards the surface of the skin, but burrow right into the flesh.

As is common with this and allied flies, egg-laying may take place on dead rotting animal matter. Thus Ritsema Bos took one- to two-days-old maggots of *L. sericata*, only 3 mm. long, from the place of infestation on a living sheep and placed them on rotting flesh of the sheep and ox, and also on a dead fish, and these maggots lived quite well and completed their development.

In warring against *L. sericata* the following are recommended:—

1. During the fly season let the sheep be kept as clean as possible, that they may be the less likely to attract the fly.
2. Attack is more likely on low-lying sheltered parts of the meadows where there is moisture and rank growth than in the open.
3. Let the neighbourhood of any wounds be dressed with something which will prevent the female from egg-laying—for example, paraffin.
4. Careful and repeated inspection to ensure that the attack will be dealt with as soon as possible, so that the maggots being killed, succeeding generations are made impossible. It will be remembered that potentially a maggot may represent four hundred succeeding flies.
5. Isolate diseased sheep.
6. Where the maggots have bored into the flesh and the wounds are deep, the sheep should be killed, or, as treatment is difficult, let a veterinary surgeon be called in.
7. The maggots are not difficult to kill. Where seen they should be picked off, or where they have got to work let the wool be shorn a little, and the parts dressed with turpentine and rape-oil in equal parts, or benzine or carbolic acid should be sprayed over the places. Cuff's fly-oil has been praised to me by those who have used it.

THE FLESH-FLIES.

These belong to the genus Sarcophaga, characterised by their being viviparous, the female depositing living maggots on decomposing matter—animal or vegetable—or in wounds, according to the species. The large ovaries of the female may contain 20,000 larvæ.

Our best-known species is *Sarcophaga carnaria* (fig. 63), a greyish-looking hairy fly, the female measuring half an inch, and the male less. The upper surface of the thorax is whitish-grey, with longitudinal black stripes. The dark-coloured abdomen has a number of whitish-grey markings resembling a check.

The maggots, which can be pressed out of a ripe female, are white-coloured, and their upper surface is markedly granulated. The pupa is black-brown. Development is not nearly so rapid as in the case of the blue-bottles. The maggots of *S. carnaria* perform a useful work as scavengers, but on the Continent there is a species, *S. magnifica*, which lays its maggots in wounds.

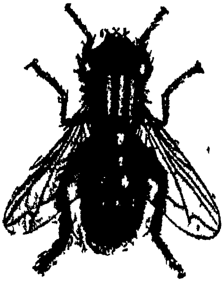

Fig. 63.—*Sarcophaga carnaria*, magnified.

Pupipara or Spider-flies.

These are parasites living on the external surface of some mammals and birds. They are often flattened, and this, coupled with their short stout legs, gives them a sprawling-like appearance—hence the popular names Louse-fly and Spider-fly. They run about or hide among wool or hair or feathers of the host; the tarsus ends in toothed claws fitted for clinging. Some are wingless, others have wings and retain them, while still others have wings at first but lose them.

A most interesting feature in their biology is that the larvæ are nourished inside the body of the mother right up to the period when they are ready for pupation, and then they are placed to the exterior in little cases or puparia, from one end of which the perfect insect emerges after a time. It is almost needless to add that these puparia are laid only one at a time.

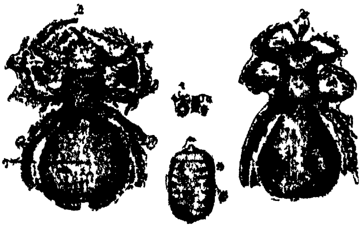

Fig. 64.—*Melophagus ovinus.*

1, Female ked. 1*a*, Puparium.
2, Male ked. *a*, head, *b*, thorax, *c*, abdomen; *d*, limbs; *f*, rudimentary balancers.
4, Female ked.
5, Pupa case. *a*, head-end.
(After Curtis.)

Of the three sub-families of Pupipara one is parasitic in hives, its single form, *Braula cæca*, hanging on to the thorax of bees, although they can also run actively over the bee; a second sub-family has its members parasitic on bats; while the third sub-family, the Hippoboscidæ, contains the members which concern us.

The Hippoboscidæ have flat heads with large eyes; the rest of the body is also flattened. We note four genera—*Melophagus ovinus*, the Sheep Ked; *Hippobosca equina*, the Forest Fly of the horse; *Lipoptera cervi*, the Stag Forest Fly; *Ornithomyia avicularia*, parasitic on birds.

MELOPHAGUS OVINUS (L.), THE SHEEP LOUSE FLY, KED OR KADE.

This (fig. 64) is a wingless insect, measuring about a quarter of an inch, the males being somewhat smaller than the females. In colour they are brownish, the abdomen brownish-grey and irregularly spotted. Over the body there are bristles.

The head, wider than the thorax, carries a pair of very small eyes and two small antennæ, so sunk in pits that only the end is visible as a little knob or wart. Proboscis tubular. The square thorax bears the three pairs of strong bristly legs, each ending in two strong two-toothed claws and a plumed bristle. The flattened abdomen, with a tough integument, is narrowed in front and widens posteriorly. The keds live among the wool of the sheep, coming towards the surface on a sunny day, hiding nearer the skin among the fibres of the wool in colder weather, or to evade capture. They are not able to live long away from their hosts, from which they derive shelter, warmth, and food. After shearing, when the wool is short, the keds are not found so spread over the body, but in order to escape the teeth of the sheep they collect more on the anterior region — the neck, shoulders, and ears.

The females glue to the fibres of the wool little puparia—laid singly and at intervals — shining, oval, and reddish-brown. Each puparium contains a maggot ready to pupate, this maggot having been nourished in the body of the mother on a secretion prepared in uterine glands. The imago issues by a crack at one end of the puparium, and experimentally it has been shown that escape may take place in a month from the date of laying, in a favourable temperature.

In numbers, and especially on lambs which remain thin in consequence, the keds give rise to much irritation by their puncturings. The infested sheep bite, scratch, and rub themselves. Curtis, in the course of some experiments, fed keds on the back of his hand, and when the proboscis made the puncture the experimenter felt a slight twinge, which in a day or two was followed "by little swellings which began to itch, and which itched for more than a week. The itching was far more persistent than with mosquito-bites." Curtis suggests that the after-swelling and itching were due to a poisonous fluid secreted by the parasite in order to prevent coagulation of the blood, which would have interfered with its free flow.

The places on the skin of the sheep punctured by the proboscis show as dark spots surrounded by a red area.

Treatment.

This is a pest not difficult to war successfully against. It must be remembered that the ked spends all its life on the sheep, and so clean sheep can only become infested from others that harbour the pest.

Dipping is widely practised, the bath containing some substance which will poison or suffocate the keds—*e.g.*, carbolic acid, or arsenic or kerosene or tobacco. After dipping, a few days should elapse before allowing the sheep to return to their old feeding-grounds, so that any keds which may have hatched on or tumbled to the ground may have perished. A second dip should follow the first, say two weeks later.

Here are two easily-made dips, the first recommended by Curtis, the second by Somerville.

(1) 1 lb. soap.
1 pint crude carbolic acid.
50 gallons water.

Dissolve the soap in a gallon of boiling water, add the acid and stir thoroughly. Keep the mixture well thinned, and do not let it into the mouths, nostrils, or eyes of the sheep. Hold each sheep in the bath not less than half a minute.

(2) 2 lb. arsenic (arsenious anhydride).
2 lb. soda (sodium bicarbonate).
3 quarts spirits of tar, or else 1 gallon of crude carbolic acid.

Boil the arsenic and soda together in 5 gallons of water till dissolved, after which the solution is diluted to about 80 gallons and the spirits of tar or the carbolic acid added. This will give enough to dip 100 sheep, and the cost is only 2s. 6d.

HIPPOBOSCA EQUINA (L.), THE FOREST FLY (Fig. 64*a*).

This fly has for its chief locality in our country the New Forest, but it has been recorded from other parts of the south of England, and from Wales. The fly, which is winged and retains its wings, is a quarter of an inch long and flattened in appearance. The colour is glossy brown, with lighter markings. The round yellow head is distinct from the thorax. There is a dark stripe in the middle of the face. There are large compound eyes and very short antennæ. The brown thorax has three yellow patches, two anteriorly and one in the middle. It carries the two wings and the three pairs of strong, yellow legs, whose tarsi end in two curved claws, each of which is bifid. From the pads of the feet there also extends a bristle with small processes along it. The whole foot is admirably adapted for clinging.

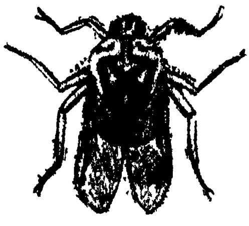

Fig. 64*a*.—*Hippobosca equina*, twice natural size. (Original.)

The puparia laid by the female are white at first, but soon darken into their normal coloration. Flies have been proved to emerge within four weeks after the laying of the pupa-case: the time will depend on the season and temperature.

The flies, which are reported as most troublesome in the autumn, are found fixed to parts of the horse's body where the skin is soft and the hair not plentiful: round the anus and vulva, on the inner side of the thighs, and belly.

To obtain the blood, which is their diet, they make a wound with their mouth-parts, a two-parted sheath enclosing a sucking-tube. The flies, however, are not necessarily stationary, but they may be very active, running backwards or forwards all over the horse or sidling along like a crab. This, according to general testimony, is more than the prick of the mouth-parts the cause of fear and annoyance to the infested horses, which, till they get accustomed to the fly (and some never do), rear or plunge or roll themselves about, showing every sign of discomfort.

Treatment.

Careful grooming will prove a useful aid against the forest fly, as, though able to fly, *Hippobosca equina* shows no anxiety to quit its host, and so horses badly attended to may come to harbour many pests.

Flies caught on the horse—and they are neither easy to catch nor hold—should have their heads pulled off or their thorax sharply pinched, for pressure on the abdominal end may not be fatal, as this region of the body is tough and horny.

To keep off the flies in districts where they are common, recourse is had to deterrent dressings. The animals or the places where *equina* usually collects may be rubbed with paraffin. On the Continent a wash quoted by Neumann is used. The recipe is—

2 oz. asafœtida.
5 oz. vinegar.
8 oz. water.

The same authority recommends the leaves of the walnut-tree steeped in vinegar, or a weak decoction of tobacco-and-water—3 oz. to a quart of water.

LIPOPTERA CERVI (*von Siebold*), THE DEER FOREST FLY.

This fly, though well enough known on the Continent as a pest on deer, seems to have attracted little notice in Britain; indeed the last two Annual Reports of Miss Ormerod contain almost the only recorded observations of its infestation.

There has been a good deal of confusion over the identity of *L. cervi*, quite a number of names having been given to it at different times, and some of these having been given to it from the idea that different species were being described. For example, while working over the Diptera in the Munich collection, I met with two flies named *Ornithobia pallida* and *Hæmobora pallipes*. Both these names are found in the literature of the subject standing for separate flies, while it is practically certain now that both are just winged forms of Lipoptera.

The deer forest fly measures one-fifth of an inch. It is yellow-brown in colour, somewhat warty on the upper surface, tough, and bristly. The short, hairy, light-coloured legs end in black claws. The males are certainly winged to begin with, but when they are found on the deer their wings have been shed or torn off or lost in some way. Whether the female ever has functional wings has not been absolutely proved, but in specimens taken from the deer there are always notched stumps, which may represent all the wings the females ever possessed, or the remains of wings, the other parts of which have been lost. More evidence, however, is wanted.

But in the winged condition and later, Lipoptera can be troublesome to man. I know of foresters being much bothered by the insects flying on to them and hiding in their hair and beard; and huntsmen, or those who have to do with the killed deer, are similarly worried by the wingless forms (which may be in great numbers on the deer) crawling on to them.

The females, as in the rest of the family, lay little shining puparia among the hairs of the deer. Nitzsch says they are not fastened very firmly, but are easily rubbed off, as shown by their being found plentifully in the snow or where the deer has made its bed, and this may account for the difficulty that some have in procuring puparia on the deer.

The pupa stage lasts over the winter and the flies emerge in the summer. In the autumn both males and females may be found running over or clinging to the deer.

As to the harm the Lipoptera does, Miss Ormerod in her Report for 1898 quotes a correspondent who, writing from

Muir of Ord in February and March, describes as frequent the finding of stags and hinds with large surfaces of the body where the hair has been rubbed off in the efforts of the deer to rid themselves of Lipoptera and its irritation.

ORNITHOMYIA AVICULARIA (L.)

This insect, parasitic on various birds—*e.g.*, fowls and pigeons—is winged, and can at pleasure leave one host and fly to another. It is less than a quarter of an inch in length and greenish-yellow in colour, but the upper surface of the thorax darker. The wings are smoky. The legs are bristly. Van Beneden has recorded a case where some of these flies quitted their bird-hosts and attacked a number of soldiers, the Ornithomyia "penetrating in the middle of the night through the open windows into one of the apartments of the military hospital at Louvain, and the next morning the skin of many of the patients, and especially the bed linen, were covered with stains of blood."

For the use of those who may at any time wish to consult a work that deals with the Parasites in great detail, I bring together the titles of some of the principal books on the subject to which I have referred in the course of this communication:—

Neumann's Parasites and Parasitic Diseases of the Domesticated Animals. Translated by Fleming. Published by Baillière, Tindall, & Co.
Traité de Zoologie Medicale et Agricole. By A. Railliet. (Asselin & Houdeau.)
The Animal Parasites of Sheep. By Dr Cooper Curtice. (U.S. Dep. of Agric., Washington.)
The Ox Warble Fly, by Miss Ormerod; and Miss Ormerod's Annual Report for 1896. Both published by Simpkin, Marshall, & Co.

PURE CULTURES FOR CHEDDAR CHEESE-MAKING.

By J. R. Campbell, B.Sc., Professor of Agriculture at the
Yorkshire College, Leeds.

In 1897 the Stewartry Dairy Association undertook to test the value of pure cultures of bacteria for cheddar cheese-making. The method of preparing and using these cultures was fully described in the 'Transactions' for 1898. The first experiment yielded results so favourable that a considerable number of the best cheese-makers were induced to test the cultures on a large scale. Over 100 tons of cheese were made from milk inoculated with the pure culture. Cheese made in this way were considered at the close of the season not only perfectly normal, but further, it was found that the use of the cultures was a safeguard against discoloration, soapiness, bad flavour, and want of uniformity.

The general results of the investigation showed that the organism used in the preparation of the pure cultures was one which is always plentifully found in good cheese, sour milk, and sour whey. Samples of milk were obtained from eight districts, widely separated, both in England and Scotland, and each sample was found to contain, in addition to certain undesirable bacteria, large quantities of the bacterium which appeared to be the one necessary for the production of good cheese. It was concluded that this organism, and this one alone, was sufficient, from a bacteriological point of view, for the manufacture of first-class cheddar.

An experiment in connection with one part of the investigation yielded results so important to the practical cheese-maker that it was decided to follow it up with others of a similar nature during the succeeding season. The experiment was as follows: A sample of sour milk sent to the laboratory for examination was found to contain in considerable quantities at least three distinct organisms. One, which was present in largest numbers, was to all appearances identical with the organism found in good cheese, and identical also with the organism used in the preparation of the pure cultures distributed to cheese-makers. The other two organisms differed from this in one important respect—viz., they grew luxuriantly on gelatine, and on this account their colonies were very easily distinguished from the minute ones produced by the first organism, which, as is stated, closely resembled the pure culture bacterium.

A portion of this milk was used to inoculate a tube of sterilised milk, which on the following day was found to be quite thick. A portion of the contents of this tube was then transferred to a second tube of sterilised milk, the contents of which also soured and coagulated in less than a day. A portion of the contents of this second tube was transferred to a third tube of sterilised milk, which in turn was thick on the following morning. This process of inoculating a tube of sterilised milk from the freshly coagulated tube was repeated daily for a considerable time. The final product was then examined, and it was found that the organism useful and desirable in cheese-making alone remained; the other two species, present in the original milk, had completely disappeared. The cause of this result was fully explained on pages 220 and 221 of the 'Transactions' for 1898. The result itself is of great practical importance to the cheese-maker, because the system above described of inoculating a series of milk-tubes is imitated by the cheese-maker in his method of preparing a daily starter. He does not, it is true, use test tubes, but ordinary dairy utensils. Enamelled pails are used for scalding the milk intended for a starter, and as the one milk-tube was always inoculated from the preceding one, so the contents of one pail are always inoculated from the starter prepared on the previous day.

The chief points of difference in the two processes are these:—

1. In the laboratory, tubes containing *sterilised* milk were employed; in the dairy, enamelled pails containing *scalded* milk were employed.

2. In the laboratory special precautions were taken to prevent the entrance of foreign bacteria; in the dairy it is not possible to completely guard against the intrusion of undesirable organisms; but, as the investigation showed, the results obtained by the dairyman, working with ordinary utensils, yielded a product quite as free from foreign bacteria as if he had prepared his starter from a pure culture. The pure culture must be carried on from day to day under the same conditions as an ordinary starter, both being liable to slight contamination from exactly the same sources.

During 1898 a large number of experiments were conducted in order to demonstrate the purifying effects produced by the method employed by the dairyman in preparing his daily starter. The following may be taken as typical:—

Experiment 1.—A bacterium, which brings about the coagulation of milk by the production of lactic acid, was found in a sample of milk. This organism, like the bacterium used in pure cultures, grew rapidly and in pairs in the form of a figure 8. In size, too, it resembled very much the bacterium of the pure cultures, but it differed from it in that it grew very luxuriantly on gelatine and agar. A pure culture of this organism was prepared in milk and then mixed with an equal quantity of milk containing the organism used in the pure cultures. From this mixture a portion was taken to inoculate a tube of sterilised milk, which on the following day was found soured and thick. From this, one minute portion was transferred to a second milk-tube, and another equally small portion was taken and from it gelatine plates were laid in order to determine in what proportion the two organisms were present. When the second tube had coagulated two portions were taken therefrom and used in a similar manner, one to show the relative numbers of the two bacteria and the second to inoculate a third tube of milk. This process was repeated daily until eight tubes of milk had been inoculated and a similar number of sets of gelatine plates prepared. When the colonies had developed sufficiently they were counted. The following are the results:—

Plates from tube		Bacterium of pure culture.		
1	contained	5·5	to 1 of foreign	organism.
2	"	32	"	"
3	"	38	"	"
4	"	732	"	"
5	"	1200	"	"
6	contained	the organism	of the pure	culture only.
7	"	"	"	
8	"	"	"	

These results completely confirmed those of the experiments of 1897—viz., that the system of preparing a home-made starter is one which tends to the elimination of foreign and undesirable bacteria and to the production of a starter containing the lactic organism only.

Experiment 2.—Another experiment was conducted in a similar manner, but in this case an organism which liquefies gelatine was placed in sterilised milk with the bacterium of the pure culture. The result was as follows:—

Plates from tube		Bacterium of pure culture.	
1	contained	87	to 1 of liquefying organism.
2	"	510	" "
3	"	the organism of the pure culture only.	

Experiment 3.—In this case twelve organisms undesirable in milk or its products were taken, and each grown in about 10 c.c. of sterilised milk. These organisms were selected on account of the fact that their colonies on gelatine plates were easily recognised, all being distinguished by shape, colour, or other characteristics. A thirteenth tube was also inoculated with the bacterium of the pure cultures. The contents of the thirteen tubes were (when the organisms had developed) poured into one flask of sterilised milk. From this a tube of sterilised milk was inoculated, and on the following day it was found to be coagulated, and, as in previous experiments, two portions were taken from the tube, one being used to inoculate a third tube and the other being used to prepare gelatine plates. The experiment was continued for several days. The following are the results:—

Plates from tube		Bacterium of pure culture.	
1	contained	2·4	to 1 of foreign organism.
2	"	26	" "
3	(as well as succeeding plates) contained the organism of the pure culture only.		

These results have not only high scientific importance, but by them a most important principle may be established—viz., that by starting with an ordinary sample of soured milk, even though it be impure, the operations entailed in preparing what I have designated "a home-made starter" will, in a very few days, produce a sample of sour milk containing what is for all practical purposes a pure culture of the bacterium required for the manufacture of good cheese. If the cheese-maker begins with an absolutely pure culture, in the course of a few days it will be no purer, and in no way better for cheese-making than the cultivation obtained by the home-made starter system.[*]

Experiments in the Dairy.

In the report for 1897 it was stated that further research was required in order to confirm the belief that a home-made starter is attended with practical advantages similar to those that may be obtained by the use of pure cultures. In order to investigate this point, and at the same time to clear up one or two other matters of interest, two sets of experiments were conducted during 1898 in a number of dairies in the Stewartry. One was begun early in July, the other early in August. The following carried out the first set of experiments:—

Mr JAMES ROBERTSON, Twynholm Mains.
Mr ALEXANDER KIRK, Craigraploch.
Mr WM. DEVLIN, Boreland of Balmaghie.
Mr JAMES SMITH, Slagnaw.
Mr JAMES MACADAM, Craigley.
Mr JAMES KERR, Culdoch.
Mr D. CONNELL, Chapmanton.

On Wednesday the 29th June the preparation of the home-made starter was begun by these men, each working independently in his own dairy. The starters made on the first few days were discarded, but on Monday and Tuesday, the 4th and 5th July, they were used for making the cheese. On Wednesday and Thursday, the 6th and 7th July, each of the above named cheese-makers used a starter prepared from a pure culture which I sent to him on Friday, July 1. On Friday and Saturday, the 8th and 9th July, the cheese at each place were made from a pure culture grown in scalded whey instead of in scalded milk.

One of the main objects of these experiments was to determine whether the practical results from the use of a home-made starter are as good as the results obtained from the use of a pure-culture starter. In the report of last year's work it was stated that in two dairies some of the cheese made with the pure cultures had a tendency to "tightness." This tightness it was thought might be caused by the casein used in the milk-starter. The experimental cheese made on Friday and Saturday, the 8th and 9th July, were intended for comparison with those made with the milk culture, in order to see whether the tightness was due to use of milk as a medium.

The second set of experiments were made in the week beginning August 1, and these were conducted on exactly the same lines as the first set; but on the 8th and 9th August an additional pair of cheese was made in each of three dairies with pure cultures prepared from sour milk sent to me from Knockdon, The Midland Dairy Institute at Kingston, and Auchenbrain. This part of the experiment was intended to demonstrate the fact stated in last year's report—viz., that the organism of the pure cultures is one and the same as that which abounds in any sample of sour milk or whey. This would apparently be proved if it were shown that cheese made with pure cultures of a bacterium selected from any sample of sour milk differed in no respect from those made by means of the pure culture distributed by me. The second set of experiments were conducted by the following, viz.:—

Mr J. ROBERTSON, Twynholm Mains.
Mr JAS. SMITH, Slagnaw.
Mr JAS. MACADAM, Craigley.
Mr JAMES KERR, Culdoch.
Mr D. CONNELL, Chapmanton.

Profiting by experience gained while employed in conducting a somewhat similar experiment in 1897, I employed each starter on two consecutive days instead of for one day only. It is a well-established fact that even the best cheese-maker, working under exactly similar conditions, is not capable of set purpose of producing on two consecutive days exactly similar cheese. By adopting on this occasion the system of making cheese in several dairies, and on two consecutive days, with each of the starters employed, it was hoped that the results obtained would be much more reliable than those made in the earlier experiments. When the cheese were made they were carefully marked and placed in the curing-room of the dairy. The first set—viz., those made in July—were judged on October 8, and the second set—viz., those made early in August—were judged on October 29.

The scoring was intrusted to the able hands of Mr John Robertson, of Messrs A. Clement & Sons, Limited. Mr Robertson was advised to select an expert to act along with him, and for this purpose he secured the services of Mr Henry M'Fadyean cheese instructor to the Wigtownshire Dairy Association.

In judging cheese made on different systems it is of the utmost importance to guard against any knowledge of the different systems being conveyed to the judges. Mr Robertson requested me to take special precautions to prevent his learning how and with what starters the cheese in these trials were made. For this purpose the cheese at each dairy were presented to the judges in an order different from that in which they were made, and at each dairy a separate order was adopted. On this account the results are of special value and are the more reliable. Three printed cards were given the judges for each dairy; of these three, when filled up, one was handed to the cheese-maker, the second was retained by the judges, and the third forwarded to me. The scale of points arranged was as follows: quality, 35; flavour, 30; texture, 15; colour, 15; appearance, 5,—total, 100. Mr Robertson defines these properties of the cheese as follows:—

Quality.—Fatness combined with firmness of body as distinct from softness and hardness.

Flavour.—The properties that affect the sense of taste and smell.

Colour.—Uniformity of internal appearance—bright and clear as distinct from dull, cloudy, or mottled.

Texture.—The condition of the component parts as to solidity as distinct from openness, and as to waxy smoothness of body as distinct from grainy roughness.

Appearance.—A thin intact skin as distinct from one that is thick and cracked.

No notice on the present occasion was taken of symmetry or shape of cheese, although in the ordinary way this should be taken into account, though not necessarily for the purpose of the experiment.

In the accompanying table (p. 211) will be found figures taken from the scoring-cards, and arranged so as to admit of a ready comparison of the results of the effect of each starter on quality, flavour, texture, colour, and appearance.

TABLE I.—SHOWING COMPARATIVE EFFECTS IN CHEESE OF (1) A HOME-MADE STARTER, (2) A PURE-CULTURE STARTER IN MILK, AND (3) A PURE-CULTURE STARTER IN WHEY.

First Set of Experiments.

	Quality						Flavour						Texture						Colour						Appearance					
Maximum marks	35						30						15						15						5					
Starter used	Home made starter		Pure culture in milk		Pure culture in whey		Home made starter		Pure culture in milk		Pure culture in whey		Home made starter		Pure culture in milk		Pure culture in whey		Home made starter		Pure culture in milk		Pure culture in whey		Home made starter		Pure culture in milk		Pure culture in whey	
Date	July						July						July						July						July.					
	4	5	6	7	8	9	4	5	6	7	8	9	4	5	6	7	8	9	4	5	6	7	8	9	4	5	6	7	8	9
Dairy.																														
Twynholm Mains	33	34	33	35	34	33	27	29	27	30	28	28	13	15	13	15	13	14	15	15	10	15	15	10	4	5	5	5	3	4
Craigraploch	34	32	33	32	32	34	30	27	28	27	27	30	14	13	13	13	12	14	15	15	15	15	15	15	3	3	4	3	5	5
Boreland	34	34	32	33	32	33	30	29	28	29	28	29	15	14	15	14	15	14	15	15	15	15	15	15	5	5	5	5	5	4
Slagnaw	34	35	33	34	35	35	26	28	29	20	30	18	13	14	14	13	15	13	15	15	15	15	15	15	4	4	5	5	5	4
Craigley	32	32	35	33	35	35	27	30	30	29	30	27	13	12	15	12	15	12	15	15	15	15	15	15	5	5	5	5	5	5
Culdoch	31	35	34	34	33	34	28	29	30	30	29	29	12	15	15	14	14	15	15	15	15	15	15	15	4	5	5	5	5	5
Chapmanton	33	35	35	35	35	35	27	28	30	30	30	29	15	15	15	15	15	15	15	15	15	15	15	15	5	5	5	5	5	4
Daily totals	231	237	235	236	236	239	195	200	202	195	202	190	95	98	100	96	99	97	105	105	100	105	105	100	30	32	34	33	33	31
Total for each starter	468		471		475		395		397		392		193		196		196		210		205		205		62		67		64	

Second Set of Experiments.

	Quality						Flavour						Texture						Colour						Appearance					
	August						August						August						August						August					
	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6	1	2	3	4	5	6
Twynholm Mains	35	35	35	35	33	35	29	30	29	29	27	27	14	13	14	13	13	12	15	8	8	14	15	15	5	5	5	5	5	5
Slagnaw	35	35	35	34	35	35	30	30	30	28	29	26	13	15	15	13	15	15	15	15	15	15	15	15	5	5	5	5	5	5
Craigley[1]	35	35	33	32	33	32	30	28	30	27	30	27	15	15	14	12	15	11	15	15	15	15	15	15	5	5	5	5	5	5
Culdoch	34	35	33	35	35	33	29	30	28	30	30	28	14	15	14	15	15	14	12	15	15	15	15	14	5	5	5	5	5	5
Chapmanton	33	35	34	33	32	33	27	29	28	27	28	22	14	14	15	14	15	15	15	15	15	15	15	15	5	5	5	5	5	5
Daily totals	172	175	170	169	168	168	145	147	145	141	144	130	70	72	72	67	73	67	72	68	68	74	75	74	25	25	25	25	25	25
Total for each starter	347		339		336		292		286		274		142		139		140		140		142		149		50		50		50	

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[1] At Craigley the experiments were conducted one week later.

In studying the figures it will be well to compare the results of—

I. Home-made starter with those of the pure-culture starter.

II. The pure-culture starter in milk with the pure-culture starter in whey.

III. The pure cultures supplied by me with the pure cultures prepared from the Knockdon, Kingston, and Auchenbrain milks respectively.

I. *Home-made starter in milk compared with pure-culture starter in milk.*

The table, on account of the regularity of its figures, apart from the question of the starters used, is a monument to the skill of the men who conducted the experiments, for it will be seen that many of the cheese obtained not only full marks under one of the heads, but in several cases under all.

In the following table the aggregate marks obtained under the respective heads have been arranged so as to admit of a ready comparison:—

1st Set Experiments.

Aggregate Marks for seven Dairies.

	Quality	Flavour	Texture	Colour	Appearance
Home-made starter . . .	468	395	193	210	62
Pure-culture " . . .	471	397	196	205	67

2nd Set Experiments.

Aggregate Marks for five Dairies.

Home-made starter . . .	347	292	142	140	50
Pure-culture " . . .	339	286	139	142	50

Let us now consider whether these results do or do not justify the conclusions deduced twelve months ago from the laboratory investigations. Compared under each head the total marks obtained by the use of a home-made starter, and those obtained by the use of a pure-culture starter, show indeed some difference; but had the variations been twice as great, we could have justly accounted for them by the variation that takes place from day to day in cheese-making, even when made by the greatest expert. Undoubtedly the answer to the question before us is, that the home-made starter yields results equal to those obtained by the pure-culture starter. This finding, if the starter has anything to do with the properties of the cheese, confirms exactly the experiments made in the laboratory. These showed—

1. That the organism of the pure culture is to be obtained in all samples of sour milk.
2. That the method of preparing a home-made starter is one which exerts a purifying influence on the bacterial content of the milk used.

II. *The pure-culture starter in milk compared with the pure-culture starter in whey.*

The object in making this comparison is twofold. In the first place, it has been asserted that sour whey cannot produce good cheese; and in the second place, it was assumed on my part that the tightness which was ascribed to certain culture-made cheese last year might be due to the acid curd added to the vat in the form of a milk-starter.

The following table affords a comparison of the results:—

1st Set Experiments.

Aggregate Marks for seven Dairies.

	Quality.	Flavour.	Texture.	Colour.	Appearance.
Pure-culture starter in milk .	471	397	196	205	67
" " " " whey .	475	392	196	205	64

2nd Set Experiments.

Aggregate Marks for five Dairies.

	Quality.	Flavour.	Texture.	Colour.	Appearance.
Pure-culture starter in milk .	339	286	139	142	50
" " " " whey .	336	274	140	149	50

These figures agree almost as closely as do those in the table showing the comparison of the home-made starter with the pure-culture starter. It is perfectly evident that sour whey if pure, is as capable of making good cheese as is a home-made starter or a pure-culture starter. It would have been an advantage, had time and means allowed, to compare a home-made starter in whey with a home-made starter in milk. To my mind there is no doubt what the end would have been—a home-made starter in whey would yield a result equal to that of a home-made starter in milk. There is one point, however, in favour of the milk-starter, but this is not one that has anything to do with the question of purity. By the employment of a home-made starter in milk, the cheese-maker is able to judge somewhat of the strength of the starter by the condition of the casein in it. Casein, as is so well known, coagulates when the percentage of acid has reached a certain point, and this coagulation serves as an indicator of the strength of the starter. Whey, on the other hand, has been deprived of its casein, and the cheese-maker has to judge of the strength of its acid by taste and smell only. The experience obtained since this investigation began shows that one of the most important points in using a starter is to keep up its strength. Occasionally it happens that owing to a general fall in temperature the starter is not sufficiently forward in the morning. The remedy in such a case is to use an increased quantity of the old starter in inoculating a new one, and at the same time to raise the temperature at which it is set.

It is probable that those who use the whey-starter would fall into the mistake of allowing the starter to weaken more readily than he who employs a milk-starter, and it is just in this point that milk as a starter appears to possess a value over whey for the same purpose. Of course, no account is here taken of the promiscuous use of sour whey. It must be whey prepared after the fashion of a home-made starter, or at least it must be whey prepared as did the cheese-makers of ten or twenty years ago. As was stated in last year's report, these men had, from long experience, learned to use their whey-starter very much on the same lines as now recommended for the preparation of what I have termed a home-made starter.

Was the tightness in some of the experimental cheese last year due to the casein in the milk-starter? There is no indication in the table, of tightness being caused by milk or prevented by whey; indeed, as the notes on the scoring-cards show when the cheese fell short in texture and quality, it was owing to a lack of tightness, the cheese being too soft. There remains no further doubt of the fact that the tightness complained of last year was due to the circumstance that the cheese-makers employing the cultures erred on the side of a too thorough cooking of the curd and a too close approach to the extreme limit of safe acidity. High cooking and high acidity will undoubtedly make a firm tight cheese.

III. *The pure cultures supplied by me compared with the pure cultures prepared from samples of sour milk from Knockdon, Kingston, and Auchenbrain respectively.*

These experiments were conducted at Twynholm Mains, Chapmanton, and Culdoch. On the 3rd and 4th August the pure culture supplied by me was employed in each dairy, and on the 8th and 9th a pure culture of an organism from Knockdon milk was used at Twynholm Mains, one from Kingston at Chapmanton, while at Culdoch the organism for these two cheese was one selected out of Auchenbrain milk. The following table (p. 215) shows the results obtained. The figures

TABLE II.—SHOWING COMPARATIVE EFFECTS ON CHEESE OF THE ORGANISM OF THE PURE CULTURES, AND THREE ORGANISMS SPECIALLY ISOLATED THIS YEAR.

	Quality				Flavour				Texture				Colour.				Appearance			
Maximum marks	35				30.				15.				15				5.			
Starter used	Old[1] pure culture in milk		New[2] pure culture in milk		Old pure culture in milk		New pure culture in milk		Old pure culture in milk		New pure culture in milk.		Old pure culture in milk		New pure culture in milk.		Old pure culture in milk.		New pure culture in milk.	
Date . .	August				August.				August.				August.				August.			
	3	4	8	9	3	4	8	9	3	4	8	9	3	4	8	9	3	4	8	9
Dairy.																				
Twynholm Mains . .	35	35	35	35	29	29	29	25	14	13	14	12	8	14	7	14	5	5	5	5
Chapmanton . . .	34	33	35	35	28	27	30	29	15	14	15	14	15	15	15	15	5	5	4	5
Culdoch	33	35	33	35	28	30	30	28	14	15	12	14	15	15	15	14	5	5	5	5
Daily totals . . .	102	103	103	105	85	86	89	82	43	42	41	40	38	44	37	43	15	15	14	15
Total for each starter .	205		208		171		171		85		81		82		80		30		29	

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[1] "Old" refers to the pure culture of the bacterium which has been used throughout two seasons

[2] "New" refers to pure cultures specially prepared this year from Knockdon, Kingston, and Auchenbrain milks The Knockdon organism was used at Twynholm Mains, the Kingston at Chapmanton, and the Auchenbrain at Culdoch.

supplied by the judges do not indicate that the organism used by me in preparing the pure culture during the last two seasons is in any way different from the organisms selected out of these three samples of milk. The following table shows the total number of marks obtained by the two sets of cheese at each of the three dairies:—

	Total marks for cheese made			
	With organism of pure culture.		With pure cultures made of organisms selected from sour milk.	
	August 3.	August 4.	August 8.	August 9.
Twynholm Mains.	91	96	90	91
Culdoch . .	95	100	95	96
Chapmanton .	97	94	99	98
Total .	283	290	284	285
Grand total .	573		569	

From this table it appears that these bacteria, selected from different sources and compared with that used in the pure cultures, produce cheese of about equal quality. Whatever slight fluctuations occur in the marks are evidently solely due to variations in the processes of manufacture, or what in scientific language would be termed the personal equation of the operator. A pure culture made of the organism that abounds in every sample of sour milk is clearly capable of making a first-class cheese.

Practical Conclusions.

The sum-total from these experiments may be stated as follows:—

1. First-class cheddar cheese can be made by using pure cultures of a lactic organism.
2. This organism abounds in all samples of sour milk and sour whey.
3. The system recommended for the preparation of a home-made starter is one which exerts a purifying influence upon the bacterial content of the starter, and results in the elimination of bacteria which are unnecessary if not harmful to the production of a first-class material.
4. The use of a whey-starter is attended with results equal in every way to those obtained from a milk-starter.

Of these results by far the most important is that which shows that a home-made starter, if carefully prepared, comes after a few days to be practically a pure culture of the bacteria desired.

Preparation of a Home-made Starter.

In order to prepare a home-made starter the dairyman has to secure two enamelled pails provided with covers. In the one he pours fresh skimmed milk, and then sets it in a fairly warm place, so that in about twenty-four hours the milk will be both sour and thick. When this has occurred he skims off the surface, breaks up the centre of the mass, and takes out about half a pint. This he adds to skimmed milk which has previously been scalded to 155°–160° Fahrenheit, and subsequently cooled to about 65° or 70°. On the following morning this should also be sour and thick, or the temperature of setting has been too low. Again the surface is skimmed, half a pint extracted as before, which in turn is added to a third quantity of scalded milk. The temperature at which the second and all succeeding starters are made up must be determined by each worker for himself: it will depend upon the temperature of the room where the pail is kept during the night. On the third day the starter produced in this way, if of a creamy consistence, may be used for making the cheese, —a portion, however, being retained to prepare a starter for the following day.

This process may be repeated day after day, and if performed in a careful and cleanly manner it will go on throughout the season yielding good results. As already explained, the operation is one which in a very few days eliminates undesirable bacteria.

Precautions in preparation and use of Starter.

In the preparation and use of a home-made starter some precautions are necessary.

1. A starter will usually not be required unless there are facilities for cooling the milk in the evening. To add a starter to milk which contains bacteria sufficient to convert it into cheese in five and a half hours will produce an article that will ripen too soon, lose its colour, and develop into a short-grained dry acid cheese. Accordingly a starter should never be used where, without it, the cheese can be made in about the time specified.

2. When a starter is used the whey *must* be run at an earlier stage. The amount of starter added must depend on the time

taken to make a cheese. This varies at each place, but as a rule the time stated—viz., five and a half hours—is a fair average of what is wanted to produce a good article. When the starter finishes off the process in less time it may be concluded that too much has been used. The actual amount added may vary from ¼ to ¾ per cent, the amount depending largely upon the degree of acidity in the starter; when that is high a smaller amount must be used. The amount still depends most upon the ripeness of the milk in the vat, to ascertain which a test of some kind should be made daily, and the amount of starter to be added regulated accordingly.

3. The starter must not be allowed to become weak. If it shows signs of doing so, use a larger quantity of the previous starter to inoculate the one to be used on the following day, and see that it is placed where the temperature in the morning does not fall below 62°.

4. Avoid the practice of warming up in the morning a starter that, from its thinness, shows signs of being backward. To heat a starter in the morning is simply to coagulate the casein and prevent it from dissolving in the milk.

5. Prepare a quantity equal to about 1 per cent of the milk to be made into cheese. This—though in excess of what will generally be required—prepares for all contingencies.

6. In scalding milk with which a starter is to be prepared, set the pail containing it in water near but not at boiling-point, say about 180° or 185°. When the thermometer in the milk indicates a temperature of 155° to 160°, remove the pail and allow it to stand for ten or fifteen minutes and then cool quickly by setting in cold water.

7. After inoculating the scalded milk stir occasionally in the course of the evening, but absolutely avoid stirring in the morning. Skim off and discard the surface next morning before breaking up the starter. The portion taken to inoculate for the next day's use should be kept in a covered vessel. The time of making up the starter will depend upon the readiness with which it can be got properly soured on the following morning. About mid-day is the usual time.

The use of a starter will prevent discoloration, but it may not do so if the cheese be made too sweet or too moist. A starter is usually required where the curd becomes overcooked before sufficient acid is developed.

In what position does the practical cheese-maker now find himself in face of the results of these experiments?

At the outset of this research it was believed that bacteria had more to do in determining the quality of cheese than any other factor. The bacteriological changes in the manufacturing and ripening processes were assumed to be due to a *variety* of organisms, each performing a special function in the production of the ripe saleable article. The more recent researches of Freudenreich and Lloyd, as well as those of American investigators, had, however, indicated that lactic organisms alone produced the necessary changes.

My own studies of the bacteria in milk and cheese led me to the further conclusion that of lactic organisms one species only produced the required result. The idea of preparing and using pure cultures of this particular bacterium followed as a natural consequence, and through the enlightened policy of the Board of Agriculture and of the Highland Society, combined with the enterprise of the Stewartry Dairy Association, I was enabled to test, for the first time on a large scale, whether such cultures, containing as they did one species of organism only, would produce cheese of desirable qualities.

The result of the first year's work, as shown in the last report, more than verified my conclusions. But work in the laboratory led to two important and interesting discoveries. The first of these was the fact that it is well within the power of any dairyman to prepare what is practically a pure culture of the same bacterium as that which I have been in the habit of supplying from the laboratory. The second discovery is, that the sour-whey starter, used by some of the successful cheesemakers before the introduction of the American system, was practically a pure culture. These men had, therefore, by empirical methods, attained the same end as that to which we have been led by the more accurate guidance of bacteriological research. However interesting from a historical point of view this latter finding may be, it must give place in practical significance to the former of the above-mentioned discoveries; for in this lies the answer to the question which at this stage of the work forcibly suggests itself to every dairyman—viz., "Is it necessary to use a pure culture; and if so, how may such be obtained?"

Wherever a starter is necessary, the use of a culture practically pure is imperative, whether such be obtained from the laboratory or prepared by the "home-made starter" method.

We cannot, however, too forcibly endeavour to disabuse the mind of the cheese-maker of the hope that any bacterium will ever be discovered that is capable of turning milk into good cheese without the exercise on his part of cleanliness and intelligent deduction from observation. Important though the possession of a pure culture may be, technique must now, as the result of this investigation shows, be regarded as more important still; for no amount of bacterium will compensate for a deficiency of that keenness of sense which is the result only of long and patient training. Pure cultures may now be bought for a few shillings in the open market; but there is no royal road to the acquisition of skill of eye and hand.

My thanks are again due to all those who assisted me so enthusiastically, and especially those above mentioned who conducted the experiments. I was again efficiently assisted in the work by Mr James Howie.

LIME AND ITS USES IN AGRICULTURE.

By Dr A. P. Aitken, Chemist to the Society.

THE original state in which lime occurred on the surface of the globe, and in which it is still to be found wherever the primitive rocks are visible, was that of a slag, bearing evidence that it was once in a state of fusion. In these once molten but now cold slags lime is in combination with silica, forming along with other bases—such as alumina, magnesia, potash, &c.—complex silicates. As may be inferred from the high temperature at which they were formed, these silicates are very stable substances, almost seeming to defy the hand of time to change them. Nevertheless they are changing, although in some cases with exceeding slowness, and the agencies that are taking the most active part in their change are the soft and gentle substances air and rain.

The constituent of the air that is chiefly concerned in the decomposition of silicate of lime is carbonic acid—a feeble acid that is present in the air to the extent of only about one part in three thousand, and though it is present in the air of the soil much more abundantly, its power of dissolving the primitive rocks must under present conditions be very slight, and the operation one of extreme slowness.

It is evident, however, that in former times, and especially during the long epoch when the planet in cooling down had not attained a temperature much below that of boiling water, and while the oceans were yet forming themselves from a mighty atmosphere of steam, the solvent action of the great torrential rains, impregnated with carbonic acid, which in those remote times existed in the atmosphere far in excess of its present proportions, must have worn down and dissolved the hard siliceous rocks in a manner and at a pace that in these cool times we cannot adequately conceive.

Carbonate and Bicarbonate of Lime.

When water and carbonic acid together act on silicate of lime they decompose it, forming the carbonate of lime, which, though insoluble in water, is yet easily soluble in water containing carbonic acid, forming a substance that is called bicarbonate of lime. This substance exists only in solution, and decomposes whenever an attempt is made to dry it. When water containing it is simply exposed to the air the carbonic acid, which keeps the carbonate of lime in solution, escapes into the air as a gas, and the carbonate of lime falls down as a fine powder.

The formation of bicarbonate of lime can be demonstrated very simply. All that is needed is to take a little clear lime-water in a tumbler and blow one's breath into it through a tube, for expired air contains much carbonic acid. The clear lime-water will at once become turbid, and the turbidity will go on increasing for a time; but it will be noticed as the operation of blowing continues that the turbidity gradually diminishes, and in a few minutes the solution is as clear as at first. The water now contains the bicarbonate of lime. That is the substance that is chiefly responsible for the hardness of ordinary spring-water, and which, when the water is boiled, causes incrustations in kettles and boilers. The incrustation is the carbonate of lime, and its deposition is due to the escape of the carbonic acid gas which kept it in solution. The same thing would occur in the cold, but much more slowly, if the hard water were simply allowed to evaporate.

How Stalactites are formed.

This is a process that has gone on on a large scale in the past, and which is still going on. A familiar example of it is seen in the stalactites which depend like icicles from between the stones forming the arches of recently built bridges, and from caves in limestone districts, and from the roofs of cellars and the like. These are caused by the drip of water charged with carbonic acid which, in passing between the stones, has dissolved some of the carbonate of lime in the mortar. As soon as the drip is exposed to the air some of the carbonic acid escapes, and the carbonate of lime which it held in solution clings to the base of the drop. This process, infinitesimal in the case of each individual drop, gradually causes the growth of a tube of carbonate of lime, and this, ever broadening and widening, may eventually grow into a pillar where the stalactite from the top of the arch or cave meets the stalagmite, forming in a similar manner at the place where the drip falls on the floor. Beautiful examples of such pillars are to be seen in the grotto caves at Cheddar, and in many other places.

Limestone Deposits.

The hardness of ordinary water is due to its containing in the first place carbonic acid, and thereafter having been for a long time in contact with carbonate of lime in the soil or in the rocks beneath it. Water of that kind issuing from springs causes large local deposits of carbonate of lime, and it is to a process of that kind going on in past ages that great deposits of limestone owe their formation. That is only one of the many ways in which limestone has been formed, and I have chosen it only as an example of a chemical process that is constantly going on in every soil.

Varieties of Limestones, &c.

Deposits of carbonate of lime are found among all the stratified rocks, from the oldest to the youngest, and they present great variety of structure Some are soft, such as chalk; others hard and capable of receiving a high polish, such as marble. It occurs perfectly pure in large fine crystals as calc spar or Iceland spar, and also as Arragonite. It is also found combined with carbonate of magnesia in dolomite or magnesian limestone; combined with clay, forming argillaceous limestone, which is prized for making hydraulic cements; and when combined with silica it forms siliceous limestones, many of which are valuable building stones. Ordinary limestones present great variety of colour—from black and blue, due to the presence of carbon, and brown and yellow, due to varying proportions of iron, to white. The best limestone contains upwards of 90 per cent of carbonate of lime, and the lower qualities may contain no more than 40 per cent. For agricultural purposes a pure limestone is not essential; but as its agricultural value depends almost entirely on the quantity of lime it contains, the purer it is the better.

Carboniferous Limestone.

Many limestones, and indeed the most of the limestones found in Great Britain, are really animal deposits consisting of the shells of molluscs and other shellfish visible to the naked eye, and also of the shells of innumerable small marine animals which are either invisible or seen only under a magnifying-glass. These contain much carbon, and they are known under the name of carboniferous limestones or organic limestones. On the floor of the ocean, as in the North Atlantic, there is found a deposit of the remains of shell-secreting animals, the Globigerine ooze, that extends for thousands of square miles. These great oceanic deposits have produced strata of carbonate of lime many thousand feet thick, and when thrown up into mountain ridges they constitute what is called Mountain limestone. This massive formation, derived from old sea-floor deposits or from coral-ranges, is abundant in Ireland and in central England, and furnishes limestone of high quality.

The Burning of Limestone.

Before carbonate of lime can be of any use in agriculture it must be reduced to a state of extreme fineness. This is already attained in the case of chalk and marl, and large quantities of these substances are used for spreading over or ploughing into the land where they are conveniently obtainable. To convert limestone into a fine powder by means of grinding would not be very difficult, but fortunately there is a better method of reducing it, and one which possesses advantages entirely its own —viz., the conversion of it into lime.

To convert limestone or any other form of carbonate of lime into lime requires only a high temperature and a good draught, such as is attained in ordinary lime-kilns and lime-hearths when properly constructed and managed. The carbonate of lime decomposes into its two proximate constituents, carbonic acid and lime; the former is driven off as a gas, escaping into the air, and the latter is left behind as limeshell or burnt lime, which is known to chemists as oxide of calcium.

Properties of Lime.

The lime thus formed has acquired some very important properties. It will now soak up as much as a third of its own volume of water, which it does with great energy, evolving much heat. The water enters into chemical combination, forming hydrate of lime or slaked lime, which falls down into a powder of impalpable fineness, far finer than can be attained by any amount of grinding. Moreover, this powder is a powerful base, soluble in water and possessing an alkaline reaction. When dissolved in water it forms a clear solution—namely, lime-water—but it takes several hundred times its own volume of water to dissolve it.

The Fate of Slaked Lime.

When slaked lime is applied to the soil it will in the first place exert its alkaline action on any acid substances it may meet there, and if the land is sour, from whatever cause, it will counteract the sourness. In such circumstances the sooner the lime is incorporated with the soil and brought into immediate contact with the acids there the better. If left on the surface exposed to the air the carbonic acid gas in the air will soon unite with it and transform it into carbonate of lime, and the energetic action due to the causticity or alkalinity of the lime will be lost. Even when incorporated with the soil the same process will go on, for the air in the soil is far more abundantly supplied with carbonic acid than the atmosphere above; so that, whether on the soil or in it, the great mass of the lime applied will eventually be converted into carbonate of lime, a substance which is chemically of the same nature as the limestone before it was put into the kiln. But it is now in an extremely fine state of division, capable of being very easily dissolved by water containing carbonic acid, and converted, as already explained, into the soluble bicarbonate of lime. It is thus seen that the great object attained by burning limestone is to enable it to be converted eventually into a state of extreme fineness.

It is with lime as with other manurial substances applied to the soil—the finer it is the better, as was long ago proved by the Society's experiments.

The ultimate goal of course is solution, for until a manure is dissolved it cannot be utilised by any crop; for the roots of plants have no mouths with which to incorporate mineral matters, however fine may be their particles. Not only as regards absorption by plants, but also as regards the chemical changes occurring in the soil itself, and for the most part also the physical changes, the substances applied are effective only when they are dissolved.

Carbonate of Lime an effective Manure in Mild Liming.

When lime has been converted into carbonate or into bicarbonate it is still an effective kind of manure. The advantage it possesses over other lime salts is that it is very easily decomposed; for the carbonic acid it contains is a very weak acid, easily turned out of combination by other acids, and because it is a volatile acid it escapes as a gas, allowing the other acid to take its place, and the latter in doing so combines with the lime, forming a neutral salt, and thereby losing its acidity. The carbonic acid so liberated diffuses through the soil, and either escapes upwards 'into the air or passes downwards through the drains. The air as well as the water which passes away from the soil by means of the drains is usually rich in carbonic acid, and that is an important function performed by the drains that is apt to be overlooked. Carbonate of lime, therefore, acts ultimately in the same way as lime itself; it unites with organic and inorganic acids, whose permanent presence in the soil causes sourness, and by so doing "sweetens" the soil, as the saying is. Other forms of carbonate of lime—such as chalk, marl, shell-sand, and the like—have a similar effect; but as they are coarser and less soluble, and as they have no causticity whatever, their action is far slower. Treatment of land by such substances is very properly called a *mild liming*—a form of liming which is especially appropriate to land containing very little organic matter.

Lime cures Sourness.

The acids which cause sourness in land are chiefly organic acids excreted by the roots of plants or produced by the decay of organic matter. Hence it is that one of the kinds of soil on which lime produces a very beneficial effect is peaty or mossy land in which there is too great an accumulation of organic matter. The general name of humic acid is given to the acid substances that are formed in such circumstances, and as they have little solubility, and therefore little tendency to leave the land, it requires the application of lime to counteract their acidity.

Lime hastens Oxidation of Organic Matter.

Under the action of lime the organic matter disappears; it becomes rapidly oxidised, and it is sometimes erroneously said that the lime oxidises the organic matter. But lime has no oxygen to spare for that purpose, for though it is an oxide—the oxide of calcium—yet its oxygen is held so firmly by the calcium that it cannot part with it to organic matter. It is therefore only in an indirect way that lime can be said to oxidise organic matter. It brings about conditions that favour oxidation, but the oxygen that accomplishes the act is the oxygen of the air, and the manner in which it does so has until recently been very imperfectly understood.

Oxidation of Organic Matter brought about by Bacteria.

It has hitherto been supposed that the oxidation of organic matter was simply a direct union of the oxygen of the air with the oxidisable elements of which the organic matter is composed, whereby the carbon was converted directly into carbonic acid, the hydrogen into water, and the nitrogen into nitric acid. But the growth of the science of bacteriology in recent years has opened our eyes to the fact that these chemical changes, along with a great many others, are brought about through the instrumentality of living organisms which are the minutest *forms of life that are known.* They are regarded as fungi, *which increase by subdivision, and are therefore called fission fungi, and the general name of bacteria is given to them.* The great majority of these bacteria live upon the organic matter in the soil, and as the result of their activity oxidise the organic matter, converting it into various acid products, which if they accumulate in the soil impair their vitality, and may even kill them outright. In order that the bacteria may flourish in the soil some base must be present to unite with and neutralise the acids they produce, and the great base which pre-eminently fulfils that function is lime. Some of these bacteria decompose organic matter in the absence of oxygen, converting it into products which form the pabulum of others that require oxygen and use it for completing the oxidation of the organic matter.

The Nitrifying Bacteria.

A very important class of organisms, from an agricultural point of view, are what are called the nitrifying bacteria. These do not require organic matter for their nourishment, as most microbes do. They live upon mineral matter. It is only when the organic matter of the soil has been entirely disintegrated and mineralised, as it is sometimes called, that they can find the nourishment they require. The nitrogen of the organic matter in the soil is converted into ammonia by some kinds of bacteria, and this unites with carbonic acid, which is also in great measure the product of bacterial life in the soil, and thus carbonate of ammonia is formed. The nitrifying organisms seize hold of the carbonate of ammonia and convert it by means of oxidation into nitrous acid, which is no sooner formed than another set of nitrifying organisms takes it and still further oxidises it into nitric acid; and when we consider that it is in the fully oxidised state of nitric acid that agricultural crops obtain the nitrogen required for their growth, we see how important it is that the conditions subsisting in the soil should be such as to encourage the growth and activity of these minute subterranean workers—the modern representatives of the fabled gnomes whose mission it was to prepare the mineral treasures of the earth for the service of mankind.

Lime advantageous to Nitrifying Organisms.

It is only twenty-two years ago that the existence of the nitrifying organisms was discovered by two French chemists, Schlösing and Muntz; but they were not actually seen till about ten years ago by Warington and P. Frankland in this country, and by Winogradski, the Russian physiologist, who by a skilful method has been able to isolate and make pure cultivations of them. They are evidently of various kinds, and some of them are so minute that a row of 50,000 of them placed side by side would not extend further than an inch. They are present in nearly all soils, and are among the most helpful and laborious of all the friends of the farmer. Even before they were seen their characteristics and mode of life were carefully studied by Warington, and only a few of these need here be referred to. It was found that they worked best in the dark, that they required plenty oxygen to enable them to perform their work, and that therefore they were found most abundantly near the surface of the soil, and that they required lime or magnesia or other base to neutralise the acids which they formed.

This knowledge added a new meaning and a fresh interest to the process of liming, and it also afforded an intelligent explanation of at least one of the kinds of mischief caused by overliming. It was found that an overdose of lime killed the nitrifying bacteria. They cannot live in a strongly alkaline solution; for even lime-water, weak as it is, is nevertheless twice as alkaline as they can bear. What they require is not that the soil should be alkaline, but that there should be a base present to prevent its becoming acid. Finely precipitated carbonate of lime is admirably fitted for that purpose. It is insoluble in water, and is therefore neither acid nor alkaline; but it is soluble in nitric acid, and the carbonic acid it contains at once gives place to the nitric acid formed by the nitrifying bacteria, and it escapes into the air, leaving the lime in the soil in combination with the nitric acid as nitrate of lime. It is well known that when ploughed in deeply lime loses much of its efficiency. and the practice is to keep it as near the surface as possible. We are now able to understand the reason of that. The nitrifying bacteria are living mostly near the surface, where they are forming nitric acid most rapidly, and it is advantageous that the carbonate of lime should be there to assist them.

Wall-Nitre.

The value of lime as a means of securing nitric acid was known at the end of last century, and turned to very practical account. During the Napoleonic wars the French were in great straits for want of nitre wherewith to make gunpowder, for the British held the nitre supplies of India in their possession, and a reward was offered by the French Government to any one who would find some way of producing it. It was found that there was plenty of nitre obtainable in Paris. On the mortar of the walls of old stables, cow-sheds, and places where animals were kept, a white crystalline efflorescence had long been observed which was found to be nitrate of lime. This when dissolved in water, and treated with carbonate of potash, formed carbonate of lime, which fell out as an insoluble precipitate, leaving nitrate of potash in solution. When this solution was evaporated down, pure nitrate of potash—the nitre required for making gunpowder—crystallised out.

This discovery was followed by the immediate demolition of most of the old stables in Paris for the sake of the nitrate of lime contained in their mortar. The source of that nitrate was the ammoniacal gases given off by the decomposition of the urine of animals. The nitrifying bacteria on the walls converted the ammonia compounds into nitric acid, and the carbonate of lime in the mortar united with it, forming nitrate of lime.

Nitre-Beds.

This was an expensive way of making nitre, and a simpler method was immediately devised. Heaps were laid down in the fields consisting of old mortar and organic rubbish of all kinds mixed with the dung of animals, and these were periodically watered with urine. The urine fermented, yielding carbonate of ammonia, and the nitrifying bacteria converted it into nitric acid, setting the carbonic acid free. The nitric acid in turn united with the carbonate of lime in the heap, forming nitrate of lime, and setting the carbonic acid free. The nitrate of lime formed an abundant crop of crystals, especially near the surface of the heap, and these were removed periodically for the manufacture of nitre. The heaps were known as nitre-beds, and they were much in vogue on the Continent, not only for the use of gunpowder manufacturers but also for the use of farmers, who by that means had an economical method of making nitrate for application as a manure. The importation of nitrate of soda from the enormous deposits discovered in Chili has rendered the making of nitre-beds less imperative now; but in the event of the Chilian supply becoming exhausted, which it will be in a few years, or the price of nitrate becoming too dear, it may be found expedient to revive the old nitre-bed system of composting under improved conditions, and with a more intelligent use of the lime required for the purpose.

Sulphate of Ammonia must be Nitrified.

The large supply of sulphate of ammonia now saved as a by-product in the distillation of coal and shale has made us less dependent than formerly on the nitrate supply; but it is important to remember that in using sulphate of ammonia as a substitute for nitrate of soda there is one important condition necessary, and that is, that there must be present in the soil the means of converting it into nitrate—there must be sufficient lime in the soil and as near the surface as possible to enable the nitrifying bacteria to go on with their work.

Effects of Lime on Bog-land.

It will be seen from the foregoing that one great use of lime is to rectify the sourness of land caused by the inordinate accumulation of organic matter. This especially occurs in the case of peaty, mossy, and boggy land. If a piece of blue litmus paper is put into such soils it is immediately reddened, showing that they have a strongly acid reaction. The application of lime to such soils has a wonderfully beneficial action, altering profoundly the character of the vegetation growing on it. The poor shallow-rooting grasses—such as the common bent-grass, hair-grass, mat-grass, sheep's fescue—and also various sedges and rushes, to which the common designation of sour grasses is applied, disappear, and in their place come up the deeper-rooting and more valuable sweet grasses, and along with them an abundant and very characteristic growth of white clover.

That lime may produce its best effects on such land, any great excess of water must be got rid of by drainage of some kind; for the water in such highly organic soils is acid, and in it the roots of the better kinds of grass perish. The soil suffers from want of ventilation, a defect which is increased by the compact growth of mosses on the surface, and especially of sphagnum moss, whose appearance is not only a sign of superabundant moisture but also a sure sign of the want of lime. In improving such soils by drainage it is of the utmost importance that the drainage be not too deep—not more than thirty inches—otherwise the upper soil loses its water supply, and the application of lime in that case will be of no avail, and may even do more harm than good.

Acidity due to Inorganic Acids in the Soil.

The excess of organic matter and the deficiency of drainage are not the only causes of acidity in soils. Even in soils where organic matter is deficient there may be an excess of acid from the application of dissolved manures, and even from the application of such neutral salts as the sulphate and the muriate of potash. In the latter case it has been found that these potash salts, especially when applied to light soils for the encouragement of the growth of clover, soon fail to be of any service, and seem to be rather hurtful than otherwise, but they immediately become effective when lime or carbonate of lime is applied to the soil. The explanation given by Adolf Mayer seems a very reasonable one—viz., that these salts are decomposed by the roots of leguminous plants, which absorb the potash contained in them and reject the acids.

Leguminous plants take up from the soil and also require for their growth more potash than other plants; but an acid soil does not suit them, therefore in absorbing the potash from these salts and leaving the acid behind, the soil becomes too acid for them. The application of lime immediately rectifies that ill-balanced condition, and enables leguminous plants to grow luxuriantly on light soil where the application of lime alone or of potash salts alone is of no avail.

Lime benefits Leguminous Crops.

It is probable, however, that the explanation here given is far from complete, for recent investigations have shown that leguminous plants differ from most others in the way in which they can obtain the nitrogenous part of their nourishment. They are not dependent as other agricultural crops are upon nitrates for their growth, but are able to utilise and assimilate the free nitrogen of the air in a way not yet quite understood. But this power which they possess is dependent on the assistance they receive from bacteria in the soil that affect their roots so as to cause the growth thereon of small warts or nodules.

In soils where the special bacteria are absent these nodules do not appear, and the plants have not the power of assimilating free nitrogen. But this power is of great service to leguminous plants, and also of great importance to agriculture, in enabling soils wherein they grow to become more and more fertile from the accumulation within them of organic nitrogen. The special bacterium that so beneficially affects the growth of leguminous plants and the fertility of the soil is known by the name *Bacillus radicicola*, and it requires for its growth and rapid increase in the soil those favourable conditions that are brought about by the proper application of lime.

Enough has been said to show the importance of lime as a means of correcting over-acidity in soils, and of promoting the health and vigour of those organisms on whose activity the fertility of the soil so greatly depends; but there are other important uses which it possesses, and these are partly physical and partly chemical in their character.

Flocculation of Clay.

As affecting the physical condition of a clay soil, the application of lime is of first-class importance. Pure clay is plastic and sticky and impervious to moisture, and it imparts that character to soils in which it is present in too great abundance. The two great mineral constituents of a soil are sand and clay, the former giving to it porosity and the latter coherence; but in order that clay may give coherence to sand without impairing its porosity it must itself be in a flocculated or coagulated condition. The agent that is best fitted to produce that condition is lime, or some soluble lime salt. What is meant by the flocculation of clay can be shown by a very simple experiment. If a little clay is taken between the finger and thumb and gently rubbed while dipped in a glass of distilled water, or rain-water, the latter will become muddy, and, while much of the fine clay may fall to the bottom as a slimy deposit, a certain amount of it will remain suspended in the liquid and continue so for many hours, or it may be permanently. If to this muddy liquid a little lime-water or a soluble lime salt is added and the water stirred, the finely suspended clay will be seen to run into little visible particles, and these will in a short time fall to the bottom of the water, leaving it clear. The clay is now in the coagulated or flocculated condition.

Hard water, which owes its hardness to the presence of soluble lime salts, would have the same effect. Clay in this flocculated condition is not impervious to water, and when mixed with sand, as it is in an ordinary soil, it cements the little particles of sand together and gives to the whole a granular condition, through which water is able freely to percolate. This is the condition of a clay soil when sufficiently supplied with lime. If, however, the lime salts are washed out of the soil by means of a little dilute acid, or even by continued washing with rain-water, the granular condition disappears and gives place to the slimy condition, and a skin of clay is apt to form which is impervious to water.

This state of matters finds its illustration in the furrows on clay soils, and in the puddles that form near gates and on head-rigs after continued rain. The rain has washed the lime salts down through the soil for an inch or two, and the clay has lost its coherence. At the bottom of each puddle a skin of unflocculated clay is found which will not allow the passage of water. By-and-by, when the rain has ceased for a time, the thin pellicle of slimy clay will begin to flocculate and the water will be allowed to go down slowly through the soil. What has happened in the meantime to enable the slimy clay to granulate is the soaking upwards to the surface again of the lime salts by capillarity from the lower level to which the too rapid fall of rain had washed them.

This peculiarity is capable of easy illustration on a small scale. If two tubes, somewhat narrowed at the bottom and loosely plugged with cotton-wool or the like, are filled with clayey soil, and if distilled water or rain-water is allowed to percolate slowly through the one, while hard water, or water to which a little soluble lime salt has been added, is allowed to percolate through the other, it will be found that the water will drop away from below clear in both cases for a time. Very soon, however, the tube fed with rain-water will begin to discharge muddy drops, and the dropping will become slower and slower, and perhaps cease altogether, while the filtrate from the other tube will go on steadily and remain perfectly clear. If now a small quantity of a soluble lime salt is added to the rain-water tube, it will, in a short time, begin to drop freely again, and the drops will be once more clear.

Formation of Deltas.

The same thing is seen on the large scale after heavy or long-continued rain when the streams are in flood; they are muddy with clay which has had the lime salts washed out of it and has lost its flocculent condition. When this muddy water reaches the sea it meets there the salts, and especially the lime salts, of the sea-water, when it once more acquires its flocculated condition and sinks to the bottom, forming banks of mud giving rise to the formation of deltas and harbour bars.

Liming aids Drains.

When water is found lying for a long time in the furrows and hollows of a field which has been properly drained, it is a sign that the soil is deficient in lime. It is thus seen that the application of lime to heavy land has the effect of drying it and improving the efficacy of the drains, and this is a matter of no little importance, especially in wet districts where the obtaining of a good tilth or "tid" occurs only too rarely.

Absorptive Power of Soils.

Besides the purely physical changes brought about by the application of lime to soils in which it is deficient, there are others which are partly physical and partly chemical, and which have to do with the capability of the soil to absorb and retain some of the substances which contribute to its fertility. It was noticed by H. S. Thomson, about the middle of the present century, that when ammonia salts were filtered through soil the ammonia was retained but the acid of the salt passed away in the filtrate in combination with lime. In the year 1850 J. T. Way published in the 'Journal of the Royal Agricultural Society' the results of a long investigation, in which, among other valuable observations, he found that when solutions of potash sulphate and ammonia sulphate were filtered through soils, the potash and the ammonia were retained by the soil but the sulphuric acid with which they were in combination came through as sulphate of lime.

Fourteen years later Dr Augustus Vòlcker published in the same Journal the results of an important investigation he made on the same subject, confirming the accuracy of Way's observations. He experimented with a variety of soils, and noted that in the case of poor sandy soils the application of lime or marl prevented the loss of potash and ammonia, and observed that "the most liberal application of farmyard manure of the best quality never produces so beneficial and lasting an effect on poor sandy soils as when they have been previously well marled or limed."

Lime aids Absorption of Potash.

In many soils far removed from limestone there is yet a large store of lime in combination with silica. These may have been formed from the disintegration and weathering of plagioclasic felspars or granites, in which lime takes the place of potash. On such soils and the clays formed from them the application of lime is of very little use. The weathering of such soils gives rise to the formation of complex hydrated silicates in the shape of zeolites, in which the lime is held in a weak state of combination. When potash or ammonia salts are applied to such soils the zeolites give up their lime in exchange for the potash and ammonia, and allow the acids of the salts to pass away in combination with lime in the same way as ordinary soils do when limed.

Lime liberates Potash.

But in the case of soils whose clay is derived from felspathic rocks or granites rich in potash, the application of lime is found to be of very great importance. The potash in such soils is mostly in combination with silica, forming silicates which retain their potash so firmly that the roots of some crops have great difficulty in absorbing it. When lime is applied to clay soils of that kind the result is immediate and remarkable, and is especially noticed in the growth of leguminous crops, which are more dependent than all other crops on finding in the soil an abundance of potash salts in an easily assimilable form. When beans, peas, clover, or the like, have been grown successfully on land that has recently been limed, they are found to contain in their ash when analysed a very much larger percentage of potash than similar plants on a similar soil that had not been limed, and the natural inference is that the effect of liming has been to liberate potash from the silica, with which it was in firm combination in the soil.

We are thus presented with two distinct and apparently contradictory facts. In the one case we have a soil containing lime which is driven out of combination by potash and ammonia, so that the soil absorbs and retains these bases and parts with its lime in exchange for them. On the other hand we have a soil relatively rich in potash, which it firmly retains, but which is driven out of combination by lime and made available for the nourishment of crops. This seemingly paradoxical behaviour is able to be accounted for in two ways: in the first place, in the contest between lime and potash where leguminous crops are grown, it is not altogether what is called "a fair field and no favour"—for the roots of the plants are, as it were, pulling the potash out of its combination on the one side, while the lime is pushing it out on the other; and in the second place, in the complex chemical reactions which are proceeding in a soil containing many delicately balanced combinations, it is not only what has been called chemical affinity that decides the direction in which the action shall go and the tug of war be determined, but chemical affinity plus mass. Even a weak base can dislodge a strong one in the end if the quantity present is great and the action is persistent, just as "the constant drop wears out the rock."

Lime precipitates Phosphoric Acid.

Before leaving this part of the subject there is one important function which lime performs in the soil which should not be forgotten, and that is the part it plays in absorbing phosphoric acid. The great mass of the phosphate applied to the soil as a manure in this country is put on in the form of superphosphate, which is a mixture of acid phosphate of lime and sulphate of lime. The acid phosphate of lime is soluble in water, and its efficacy as a manure is probably due in some measure to the fact that it may be able to soak through the soil, and be directly absorbed and assimilated by the plants with whose roots it comes in contact. It is certain, however, that this direct action can happen to only a very limited extent.

In ordinary circumstances, long before it has come in contact with the roots of the crop for which it is applied, it has entered into combination with bases in the soil and become insoluble in water. It has been precipitated and *reverted* into the state it was in before the manufacturer added to it its own weight of sulphuric acid. That, however, will occur only if the soil contains abundance of lime, and in such a case it would seem as if the labour of the manufacturer had been in vain. On the contrary, it has been entirely successful, for it has achieved the object of causing the phosphate of lime to be precipitated in the soil in a state of fineness which no amount of grinding can imitate: the surface of the phosphates which is now exposed to the solvent processes in the soil and the solvent action of the roots of the crop has been immeasurably increased, and doubtless a great increase has also occurred in the extent of soil throughout which the phosphate has been distributed over what would have been attained in mixing it with the soil by any mechanical means.

As regards this latter quality, it might be objected to the application of lime that when present in considerable quantity it will cause too immediate a precipitation, and thereby restrict the range of soil through which the phosphate is distributed. But we have to consider that there are other bases present in all soils that are ready to seize and precipitate phosphoric acid—namely, alumina and the oxide of iron—and when these unite with it they form very insoluble compounds, from which the roots of plants can obtain their phosphoric acid only with great difficulty, and the advantage of having lime in the soil is to enable the phosphoric acid to get into combination with it before the other unfavourable bases can get a hold of it. Where oxide of iron and alumina are present in large quantity they will doubtless in the end prevail, because chemical action goes steadily in the direction of insolubility; so that if there is an opportunity of a less soluble combination being formed, it will eventually be formed—and this is the reason why superphosphate is so active in the first season of its application and so inactive thereafter. But when lime is sufficiently abundant in the soil the conversion of the phosphate of lime into the very insoluble form of phosphates of iron and alumina is greatly delayed.

So far we have considered the action of lime as an ameliorator of the soil—in improving its texture, in enabling it to rid the soil of things that are injurious to the growth of plants, and in enabling it to retain and convert into favourable forms the substances which plants require for their growth; and what has been said in these respects must suffice, for to enter into greater detail would require a greater knowledge of chemistry than the average reader possesses, and would far outrun the limits set to this paper. We may now refer shortly to the manner in which lime contributes directly to the growth of crops.

Plants need Lime.

It would perhaps be too much to say that no plant can grow without lime, but it may be safely said that no agricultural plants can grow without it. For them it is absolutely essential. Some of them can get on with very little of it, and so far as their bodily requirements are concerned no special provision of it need be made for them. As a rule, the plants that require most lime are those that have the greatest amount of leaf, and it is in their leaves that lime is most abundant. The crops which require lime most, and which remove most lime from the soil, are leguminous crops. From a fourth to a half of the ash of leguminous plants consists of lime, and a good crop of clover will remove from the soil about 1 cwt. of lime per acre. Meadow hay will remove about one-third as much, and turnips and swedes about a fourth as much if the leaves are not taken off the land. Good crops of cereals will not carry off more than about 15 lb. per acre, and a crop of potatoes not half that quantity.

It is evident that, from a manurial point of view, as replacing the lime carried off in crops, except in the case of leguminous crops when the whole crop is removed, the demand for liming is very trifling; but it is otherwise when we consider the loss of lime that occurs to the land by drainage. The quantity will vary extraordinarily, according to the kind of land and other circumstances; but in ordinary circumstances, in the case of arable land under rotation, it may average about 5 cwt. per acre per annum.

When does a Soil need Liming?

The question as to whether a soil requires liming or not is one which has frequently to be determined, and it is one of considerable difficulty. A farmer of experience will be guided by a number of signs, such as the tendency to grow mosses and sour grasses when in pasture; but no very definite gauge is applied in ordinary practice. The general practice of a district as to the quantity of lime required, and the frequency of its application, derived from long experience, is the general guide. But there is also the extrinsic and not unimportant consideration of the length of time the lease has to run, and doubtless the amount of compensation to be obtained for the outlay of liming if the time is short.

This is a matter in which the analysis of a soil ought to be of some service; but it requires experience of the analyses of soils of known character and fertility to enable very accurate conclusions to be drawn from the results of analysis, except in cases where lime is found to be decidedly deficient. It is chiefly in regard to clay soils that the difficulty exists, for in such cases there may not be poverty of lime, and yet the land may be much benefited by liming.

In such cases, what is wanted is to find out how much of the lime is in an easily available form, and one way of determining that is to find how much lime is able to be washed out of the soil as bicarbonate by means of water saturated with carbonic acid. Dr Holleman, from an investigation of many stiff clay soils in Holland, where gas-lime had been applied with great benefit in some cases and with none in others, used that method, and found that it gave a very good index of the need or otherwise of liming. He arrived at the conclusion that if only about one and a half parts per thousand of lime could be washed out in that manner the land required liming; while if as much as five parts per thousand could be so washed out, liming was unnecessary. An indication of whether or not a soil has been unduly exhausted of lime can also be had by noting the relative quantities of lime and magnesia it contains. In a well-balanced soil the quantity of lime should be much greater than that of magnesia—perhaps two or three times as much. Magnesia in excess is injurious to plant life, and lime is found to counteract its effects. But the store of lime is much more severely run upon than that of magnesia when pastures have been long grazed, and when it is found that the lime in the soil is less than that of the magnesia, or when it is not much in excess of the magnesia, it is usually a fair indication that liming would be beneficial.

Methods of applying Lime.

As regards the methods of applying lime there is room for considerable difference of opinion. The object to be aimed at is uniform distribution in a perfectly slaked condition. Some instructive notes will be found on the subject in Mr Lawson's paper in the 'Transactions' (1879, p. 106). The more thorough and economical methods of grinding now available have induced some limeowners to sell caustic lime in a finely ground condition, capable of being immediately applied, and such experiments as are recorded show that it is a very useful form. It is especially applicable where small quantities of lime are being spread, and as it can be very uniformly applied by means of the manure-distributors now in use, it possesses some distinct advantages.

There is no doubt that for ordinary soils, and especially for light soils, the application of small quantities of lime, which can without much trouble be frequently repeated, is much to be preferred to the heavy limings, once in a lease, that used to be the practice; and even for stiff clays and for land suffering from excess of organic matter it is reasonable to suppose that it would be better in most cases to supply lime in smaller quantities and more frequently than heretofore. By that means the injurious effects of over-liming would be avoided.

Over-liming.

Some of the injuries done by the too abundant application of lime have been already referred to, and the chief cause of the mischief which has given lime a bad name is the erroneous notion that lime is in itself a complete manure. Such ignorance of the nature of lime is not likely to be found in these days of agricultural education. Lime when applied alone has frequently, even on thin light soils, had a marvellous effect in increasing their productiveness, and in such cases it is not surprising that, in the absence of even a rudimentary knowledge of the chemistry of agriculture, the application should be repeated, and even on a larger scale, with the effect of reducing the land to a state of poverty which it had never reached before. It is only when the soil is well supplied with the elements of fertility, or when they are liberally applied to it, that lime can be advantageously used as a manure; for as the old couplet expresses it—

"Lime and marl without manure
Only make the farmer poor."

Loss of Nitric Acid.

When applied to a light unmanured soil, the effect of liming would be to unlock the fertility resident in the soil, especially the potash contained in the silicates and the nitrogen contained in the organic matter. The increased activity of the nitrifying bacteria would rapidly convert much of the organic nitrogen into nitric acid, and this would be utilised by the first crop to a great extent, while the remainder, after the removal of the crop, would be run through the thin soil in the autumn and escape by the drains as nitrate of lime.

Nitrate of lime, like all other nitrates, is very soluble in water, and nothing but a store of organic matter in the soil and the roots of a growing crop can prevent its downward passage. To restore such soils requires the application of organic manures such as farmyard manure or green manuring. The power of organic matter to prevent loss of nitrates or anything else by drainage was very well exemplified in the long-continued experiments at Rothamsted, where it was found that in some seasons the drains from all the plots in Broadbalk field were running, except those coming from the plots manured year after year with farmyard manure which remained dry. The organic matter derived from the farmyard manure acted as a kind of sponge, retaining the moisture and the salts dissolved therein, and notably the nitrate of lime, which passed away abundantly in the drainage-water of all the other plots in the field.

Heavy Liming.

Despite what has been said regarding the greater economy and safety of applying lime in comparatively small doses rather than in one large one, there are occasions in which a heavy liming is indicated and followed by beneficial results which repeated small limings would not easily achieve. This occurs in the case of the reclamation of land from heath containing plenty of organic matter and growing heather, which is another of the plants that indicate want of lime; also on loamy land resting on retentive clay, where it is of more importance to increase the porosity of the subsoil than to conserve the organic matter of the soil itself.

Somewhat drastic treatment by liming is also required in the improvement of old pastures containing plenty of organic matter, but which have become fogged up by the undue growth of moss and worthless superficial weeds and grasses, preventing the aeration of the soil. In such circumstances a heavy dressing of lime works a wonderful transformation: the mosses and weeds disappear, and the shallow grasses give place to the deeper-rooting kinds; the seeds of clover that have been lying dormant begin to germinate as the air gets access to them, and in a short time the entire character of the pasture is changed.

In all such cases, however, it would be an injudicious thing to plunge immediately into all the trouble and expense of a heavy liming before having ascertained by experiment on a small scale that such treatment was necessary or advantageous. Even where it is ascertained to be necessary, some preliminary test to indicate what quantity per acre is most beneficially applied might save a good deal of needless expenditure of money and labour.

Functions of Lime in the Economy of the Plant.

It is always a difficult matter to discover what the precise function is that any particular constituent that is essential for growth performs in the economy of the plant. As regards lime, it has been found that green-leaved plants refuse altogether to grow in a soil from which it is absent. If the seed contains a considerable store of lime in it the young plant will make some progress, but its growth will be arrested as soon as the store contained in the seed is exhausted. If attempts are made to grow cereals in soils in which lime is very deficient, they continue to grow in a poor way until the time when the seed should be forming, then they grow pale and wither from above downwards. They grow pale from inability to form chlorophyll, and they wither back from inability to form carbohydrates. The cells in the upper part of the plant are seen, when examined under the microscope, to be almost destitute of starch. In the lowest leaves, on the other hand, and in the under part of the stem, the cells are found crowded with starch which is unable to find its way into the circulation.

It will seldom, if ever, be found that a soil is so destitute of lime as to be unable to yield to the crops grown on it the quantity of lime required to enable them to form the chlorophyll necessary for the formation of starch, and for its circulation throughout the plant. But lime has other functions to perform; for just as it is the great medium for preventing undue acidity in the soil, so is it also the base which is pre-eminently required to counteract acidity in the juices of the plant. One of the acids which are apt to accumulate in plants to their detriment is oxalic acid, and there is no base which is able to cure that so well as lime; for it forms with oxalic acid an exceedingly insoluble salt, the oxalate of lime, which is found very abundantly in some plants in a crystalline form, thrown out, as a kind of waste product, in parts of the plant where its presence can cause least inconvenience.

Lime counteracts Magnesia.

But there is another service which lime performs in the economy of plant life which is a very important one—namely, that of counteracting the injury which is liable to occur to plants from the excess of magnesia. A certain amount of magnesia is imperatively required by plants, especially during the time when they are maturing their seed. Its function in that process is to enable the seed to obtain easily the phosphoric acid required for the nourishment of the embryo, and as the result of that it is found that the ash of cereals contains more magnesia than lime, while in the stem, roots, and leaves lime is present far in excess of magnesia. Many experiments have been made which prove that excess of magnesia in the soil, in certain forms at least, is hurtful to plants, and the cure for that has been found in increasing the quantity of lime.

It was thought at one time that lime and magnesia could entirely replace each other in the soil and in the plant, but that is found not to be the case. Each has its own function to perform that cannot be undertaken by the other; but a comparatively small amount of magnesia is needed, and it will rarely, if ever, be found necessary to apply magnesia salts as a manure where liming is carried on, for all limestones contain some magnesia, and some contain very large quantities of it.

Magnesian limestone when burnt yields a lime containing 30 to 40 per cent of magnesia and 50 to 60 per cent lime. Despite the large amount of magnesia it contains it does not seem to be unfit for agricultural liming, and in some parts of the Continent it is even said to be preferred to ordinary lime. Information on that point derived from experiment is much needed here, for there are strata of magnesian limestone in some parts of the country, such as in Fife, of very fine quality.

The fact that lime derived from magnesian limestone is used with advantage is probably due to the greater proportion of the lime which accompanies the magnesia. Lawes and Gilbert have for many years applied sulphate of magnesia to some of the plots at Rothamsted without apparent injury, but that may be owing to the large store of lime salts present in the Rothamsted soil. The fact that some kinds of magnesian compounds are injurious to plant life has been determined experimentally on the small scale and by means of water culture, and it has also been found that the addition of lime counteracts the injury due to these salts; but how it is that lime exerts its beneficial effect in that way, and what are the proper relations of lime to magnesia in the soil and in the economy of plant life, are subjects of both practical and theoretical interest that await investigation.

Soils become exhausted of Lime.

That it is more important to increase or maintain the store of lime than of magnesia in the soil is evident from the fact that in ordinary agricultural operations lime is being lost to the soil far more rapidly than magnesia.

In the first place by the drains. The analysis of drainage water usually shows lime to be present in as great quantity as all the other mineral constituents together, while the quantity of magnesia is trifling. This is to be expected from the fact that while lime is soluble in water magnesia is not, that the carbonate of lime is more easily soluble in water containing carbonic acid than carbonate of magnesia is, and that magnesia forms silicates in the soil that are far more insoluble than the corresponding silicates of lime.

In the extensive series of analyses of the drainage waters derived from the plot of Broadbalk field at Rothamsted, made by Dr Augustus Volcker and published in the 'Journal of the Royal Agricultural Society' (1874, pp. 132-165), it is seen that the plots which received 100 lb. per acre of sulphate of magnesia, along with other mineral manures, produced an effluent no richer in magnesia than that which drained away from the plot (10) that had no mineral manure applied to it, but only a supply of ammonia salts. When in addition to ammonia salts 100 lb. of magnesia sulphate was applied (plot 14) there occurred, as was to be expected, an increase in the proportion of magnesia in the drainage waters; but the remarkable thing is that in the drainage of that plot there should constantly be found a greater proportion of lime than in any of the other plots. The effect of the magnesia seems to have been to drive the lime out of combination. The proportion of nitric acid contained in the drainage from that plot is also exceptionally large, and it probably escaped as nitrate of lime.

In the second place, the ash of farm crops, especially those of roots and leguminous crops such as clover, is far richer in lime than in magnesia; and in the third place, there is to be taken into account, what is apt to be forgotten, that in the bones and tissues of stock the proportion of lime far exceeds that of magnesia,—so that pastures where stock are reared are being constantly denuded of lime while the magnesia is but slightly utilised.

The Balance of Lime and Magnesia in the Soil.

It is because of this unequal exhaustion of lime and magnesia that it is possible by means of analysis to determine to some extent whether a pasture stands in need of liming or not. In what may be called a properly balanced soil lying in pasture the lime should be in excess of the magnesia. Where the two are found to be about equal the indication is that liming would probably be an improvement.

Lime as a Curative Agent.

Because lime has a strongly alkaline reaction, and is a powerfully acting chemical substance, it is naturally resorted to as a kind of curative agent in various forms of disease. Fortunately one of the most serious diseases that infest the farm—the "finger-and-toe" in turnips—is amenable to treatment by it. Indeed the only curative agent that has succeeded in grappling with that pest is lime.

The finger-and-toe disease has been found to be caused by a parasite of extreme smallness, the *Plasmodiophora brassicæ*, one of the slime fungi regarding which there is some doubt whether, they properly belong to the animal or the vegetable kingdom. What it is that lime does to the fungus is not known, but it is found that after treatment with lime the fungus disappears from the soil.

Its disappearance is not always immediate, so that when a field is treated with lime just previously to its being sown with turnips the crop may after all be found badly affected with finger-and-toe. But if the lime is applied some months previously—say, on the stubble—and harrowed in, it is found that a great improvement is effected.

Still more effectual is the cure when the lime has been applied on the lea. This would seem to show that it is in the soil that the fungus must be attacked, when there are no cruciferous plants of any kind to give it shelter. When once it has found its way into the roots of cruciferous plants, it finds a hiding-place where it is secure from the alkaline action of the lime.

Composting.

For the destruction of all kinds of deleterious fungi, which require a strictly neutral or acid medium in which to grow, the great cheap alkali is the proper and ready instrument; so that the cleanings of fields composed of all manner of sour weeds and dirt in which these abound, and which, apart from the mischievous organisms inhabiting them, contain a useful store of organic matter, may be preserved to the farm if only they are composted with lime and left for a time till the mass has become disintegrated and transformed into a mould suitable for application to the soil.

If instead of liming and composting such rubbish the more drastic process of burning is resorted to, the mineral substances of value which it contains are indeed preserved, but the more valuable organic matter is lost. The nitrogenous matter, consisting partly of nitrates, is destroyed, and the dead ashes that are left have a very limited use in building up the fertility and texture of the soil.

Lime as a Disinfectant.

As a disinfectant for almost all farm purposes lime holds the foremost place. In order that it may produce its best effects, the places where it is to be applied should be in the first place made as clean as possible. Walls, floors, and other parts of stables, byres, cattle-courts, &c., should be scraped down, cleaned out, and plentifully soused with water; and in cases where any infectious disease has occurred, fumigated with burning sulphur before lime-wash is applied, so that the disinfecting action of the lime may not be overtaxed. Lime is not a volatile substance, and therefore it can have a disinfectant action only on things with which it comes in direct contact. It cannot reach many cracks and crevices in which the germs of disease may lurk, and hence the advantage of prefacing the liming by some gaseous disinfectant, such as sulphurous acid derived from burning sulphur. A little carbolic acid mixed with the lime may be of service, and still more effective the addition of some chloride of lime, which when exposed to the air slowly gives off hypochlorous acid.

Both of these substances are good disinfectants when applied in sufficient quantity; but they are strongly smelling substances, and as a little smell goes a long way, there is the danger of supposing that they are effective simply because they are apparent to the sense of smell, while the quantity in the atmosphere is quite insufficient to affect bacterial life. It is better that disinfection by these substances should precede the disinfection by lime. Lime-wash has the advantage over other antiseptic washes, that its whiteness shows where it has been properly applied and where it may have been forgotten. It conveys the mental impression of cleanness, and that in itself is of no little importance, for before workers can be trusted to carry on their work cleanly some kind of mental disinfection is necessary.

Lime as an Antiseptic.

In the poultry-yard and in hen-houses, lime ought to be used pretty freely, partly as carbonate to supply the material required for the shells of eggs, and partly in the caustic state as a disinfectant and destroyer of vermin. It is perhaps also not sufficiently well known that lime, or, better still, lime-water, which is just water with some caustic lime in it, is a very wholesome antiseptic, in which new-laid eggs may be kept fresh for a very long time. The antiseptic properties of lime have been made use of in preserving dung, and it has been found to excel all other preservatives when applied to fresh dung. Professor Emil Wolff used it at the experimental station at Hohenheim, and found that its preservative action was due to its preventing fermentation from commencing. It need scarcely be said that if fermentation has commenced and ammoniacal compounds have been formed, the application of lime would be attended with loss of ammonia. But fermentation very soon sets in, and the urine of animals is very rapidly decomposed with products of an ammoniacal kind, so that it is probable that on the large scale it would not be found possible to use lime as a preservative economically. Professor

Wolff's experiments were done on a small scale, with less than a ton of manure.

Caustic lime, on account of its causticity, is found serviceable not only in destroying vegetable pests, which cannot tolerate a strong alkali, but it has been frequently used to combat animal pests also. I have seen it used with great success in warding off the attack of turnip-fly (*Haltica*). A little dry lime sprinkled along the drills in which the braird is being attacked completely scares the little beetle, and the braird itself suffers very little injury. In the case of a widespread attack hand-sprinkling might be found too slow an operation, but in such cases the strawsoniser may be trusted to do the work more effectively.

There are many other minor uses to which lime may be put, not only in agriculture but in gardening and allied industries, and which will at once suggest themselves whenever the properties and characteristics of lime as described above are understood and appreciated.

THE BARK-BEETLES OF THE ASH

(*HYLESINUS CRENATUS, H. FRAXINI, AND H. OLEIPERDA*).

By A. C. Forbes, Calne, Wilts.

The genus *Hylesinus* of Fabricius contains four British species, three of which breed under the bark of the ash. The largest of these beetles, *H. crenatus,* is usually found in old thick-barked and decaying trees when forming its mother-galleries, and usually hibernates in similar material. *H. fraxini,* the next species in point of size, the best known, and the most numerous of the genus, is an invariable frequenter of sickly trees and felled timber of any size when engaged in reproducing its species, but hibernates in perfectly healthy trees as readily as elsewhere. *H. oleiperda,* the smallest of the three, confines itself chiefly to twigs and small branches on standing trees, and in a general way commences its work at the point at which *fraxini* leaves off.

Scarcely an ash-tree of any age can be found in the southern and midland counties of England which does not bear more or less evidence of the work of one or the other of these beetles, and collectively, if not individually, they are actively engaged in hastening the decay and reducing the strength of all but young and perfectly healthy trees. For this reason it has been considered desirable that they should be dealt with side by side in one paper, the same host-tree being common to each, and the injuries they commit being practically identical in nature.

The genus *Hylesinus* is included in the group *Hylesinini* of Eichhoff, which group is characterised by its members having the head projecting beyond the pronotum when viewed from above, the base of the latter overlapped by the forepart of the wing-cases, and the ends of these last bent over and covering the abdomen, thorns and depressions being absent on their surface.

The Genus Hylesinus

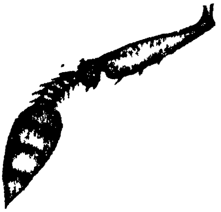

Fig. 65.—Antenna of *H. fraxini*, greatly magnified.

is distinguished from other members of the group by the possession of a horn or antenna provided with seven segments between its basal segment or shaft and its terminal club (fig. 65). The first of these segments is conical, with a concave curve on the upper side, the remaining six being small and about the same size. The terminal club is made up of four segments, and is pointed and hairy, and about double the length of the seven segments below. The eyes are oval-elliptical, with the outer margins full and rounded. The third tarsus is heart-shaped and larger than the two preceding it, the foot being of the type known as pseudo-pentamerous.

1. Hylesinus crenatus, *Fabr.*

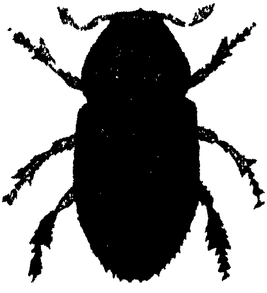

Fig 66.—*Hylesinus crenatus*, ♀.

The female beetle of this species (fig. 66) is from one-fifth to one-fourth of an inch in length, usually jet black, but occasionally brown, and oval-elliptical in shape. The pronotum is a little broader than long, narrowed in front, and covered with large shallow punctures, with a small smooth spot in the centre near the base. The wing-cases rise sharply from the base of the pronotum, are raised at the edges, comparatively flat, especially near the apex, and are marked with broad crenated lines with toothed interspaces (fig. 67) (each tooth bearing a short blunt spine pointing backwards), slightly divergent at the base. Feet and legs are bristly and reddish brown.

The males are smaller, one-sixth of an inch in length, and rather more elongated than the females.

Distribution.

H. crenatus appears to be well distributed throughout Northern Europe, and was found by Ballion in 1872, in the Crimea, breeding on the oak as freely as on the ash.[1] In the south of England the beetle appears to favour high rather than low elevations, and although Eichhoff states that it is found in France and Italy, it is probably chiefly confined to the mountainous districts of those countries.

Fig. 67.—Toothed interspace on wing-case of *H. crenatus*, magnified.

Life-History.

The life-history of *crenatus* is rather difficult to define with absolute certainty, owing to the fact that both larvæ and hibernating beetles may be found in the same tree. Personal observations in the south of England, however, enable us to assert with some amount of confidence that *crenatus* swarms from May to August, according to the appearance of the individual beetles. The greater number of beetles probably swarm in July and August,—some earlier and some later, as their development may have been accelerated or retarded by circumstances. In selecting material for oviposition the beetles prefer old thick-barked trees which have reached or have passed maturity. In most cases, some degree of decay will be found in the attacked trees; but they rarely attack dead material or perfectly healthy stems unless compelled to do so by want of suitable material. In 1897 the writer found mother-galleries being formed in August in an ash felled the previous winter, and numerous larvæ are still in the tree at the present time. But, as a general rule, felled timber is rarely touched by this beetle. Where old decaying trees cannot be found, however, the beetle undoubtedly attacks healthy trees, especially such as have been drawn up and partially suppressed by their neighbours, and in one or two years the tree may be utterly destroyed.

As with most bark-beetles, the mother-gallery (figs. 68 and 69) is usually begun in a fissure of the bark, and extends down to the wood in a sloping direction. It varies considerably both in length and form, and it is difficult to say whether the shape is influenced by the condition or thickness of the bark in any way. The normal gallery would appear to be a two-armed tunnel, with the arms running out at an obtuse angle, and frequently being curved inwards. Before branching, the gallery usually runs in a straight line for a short distance, but sometimes this short tunnel is not visible on the wood, the forking taking place in the bast. In other and numerous cases, again, the gallery is a perfectly straight horizontal line, resembling that of the elm-bark beetle with the exception of its direction. In such cases, evidence of any fork can rarely be noticed, and the direction and form of the tunnel are influenced, in the writer's opinion, by the way in which the dust can best be disposed of. In most cases the galleries cut into the wood to some extent, but where standing and growing trees have been attacked, the mother-galleries have often been formed on the surface of the bast, and so near the surface of the bark in thin-barked trees that almost the whole length of the gallery has been partially exposed to the air. When so situated, the beetles are able to avoid that flow of sap into their burrows which usually prevents living trees from being attacked to any extent.

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[1] Altum, *Forstzoologie.*

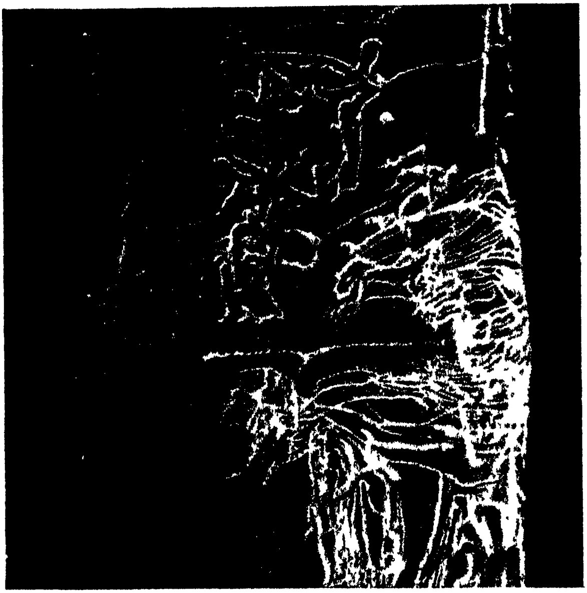

Fig. 68.—Workings of *H. crenatus* on ash stem, ½ nat. size.

The length of the arms in the forked galleries varies from half an inch to 2 inches or so, and in the straight galleries sometimes extends to 4 or 5 inches. They are about one-eighth of an inch in width. The eggs are white and elongated, and placed in niches right and left of the gallery at rather wide intervals, and from ten to thirty in each arm.

The larvæ are legless, pearly white, long, tapering, and wrinkled, with brown head and jaws. Upon hatching out they at first eat sharply into the surface of the wood in comparatively straight and parallel lines, the galleries maintaining a uniform depth and width for some distance (figs. 68 and 69), and then gradually widening and becoming tortuous, and in crowded wood very confused. In thick bark the larvæ usually eat up from the surface of the wood as they increase in size, and almost always pupate in the bast and rarely in the wood. In young and thin-barked trees, however, a few pupal chambers may be found in the wood. In those cases where the mother-galleries do not run on the surface of the wood but on the bast, no definite form of working can be detected when the bark is removed, and merely an intricate pattern with no clearly defined galleries is visible.

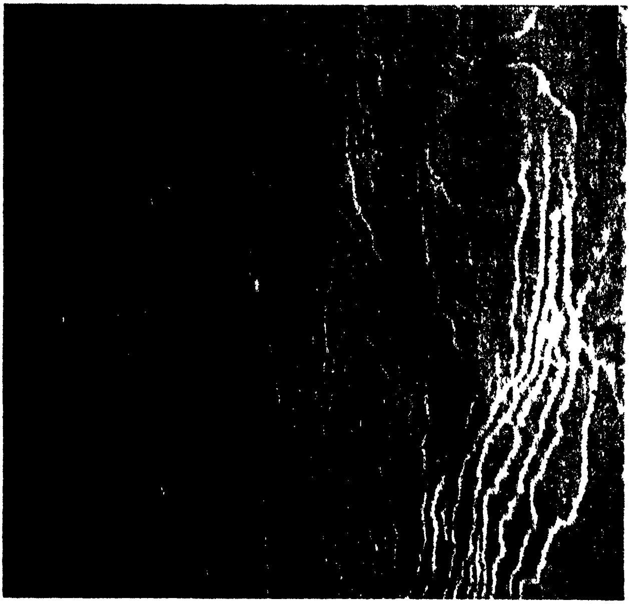

Fig. 69.—Workings of *H. crenatus* on ash stem, ½ nat. size.

The larvæ apparently feed through the winter in mild weather and pupate the following May and June, but a considerable number are much later than this in making their appearance. The normal period of development would appear to be about a twelvemonth, late swarmers taking fifteen, and probably eighteen months. Those leaving their pupal chambers after August and September appear to hibernate in the same way as *H. fraxini*, and form their mother-galleries in the following spring; but in many cases we have met with, mother-galleries appear to be formed by these late swarmers well on into the winter, and we have found eggs as late as December, although this was probably an exceptional case.

Many of these hibernating galleries, however, are two-armed, and resemble in every way the mother-gallery, except that the egg-niches are absent. In other cases they eat in as far as the wood, and follow along its surface for some distance in no definite direction, and are only left by the beetles when the return of spring fills them with sap. The beetles then leave them and bore fresh galleries on the surface of the bast until their proper swarming-time comes round in late spring.

Economic Importance.

This beetle is chiefly dangerous to old trees which are in a weakly and decaying state, or to trees in small isolated plantations in which it has secured a footing by some means. In the former case the beetles rarely leave a tree which they have once attacked until it is completely destroyed, each successive generation eating farther and farther into the least vigorous parts of the tree, destroying the cambium, and reducing the supply of elaborated sap to the roots. In this way old ash of large size may be destroyed in a few years; and the fact that more damage is not done by this beetle can only be accounted for by its comparatively small numbers, and also in some measure by the fact that ash timber is rarely allowed to remain in plantations to a great age in large numbers.

In small plantations of ash, however, the beetle may become a serious danger if allowed to increase unchecked for any length of time. In an instance under our notice of a plantation largely composed of young ash, numbers of what had apparently been healthy trees were dead and covered with the workings of *crenatus*, while others round about still living contained hibernating beetles and larvæ broods. In such a case compulsion rather than choice undoubtedly induced attack in many cases; but the fact that it is capable of breeding in living trees is sufficient evidence that its presence cannot be disregarded where ash-trees of any value are present.

Preventive Measures.

The simplest and best means to adopt when *crenatus* is present in large numbers in a plantation is to ascertain the tree or trees in which it is breeding, and to fell and remove them at once. Standing trees being chiefly attacked, the placing of "catch-trees" or bait would not be likely to prove efficacious in attracting the mother beetle, as it is rarely found to breed in felled timber left in the wood. Little can be done, again, with the hibernating beetles, owing to the galleries being scattered, difficult to locate, and the beetles some distance from the surface. The felling and removal of all trees in which the beetle is found to be breeding seems, therefore, to be the best and only effectual means of dealing with this insect, and one which requires no expense or special labour.

2. HYLESINUS FRAXINI, *Fabr.*

H. fraxini (fig. 70) is about one-eighth of an inch in length, oval in shape, pitchy or chocolate brown in colour, and irregularly covered with grey hairs. The pronotum is nearly double its length in breadth at the base, narrowing towards the head, and marked with fine punctures and small tubercles in front and covered with grey scales. At its base, on either side of the scutellum, are two brown patches, which sometimes extend forward and meet in a semicircle. The wing-cases are longitudinally marked with finely punctured lines, and are irregularly covered with grey scales which give them a mottled or variegated appearance. The legs are reddish brown and bristly. The males are rather smaller than the females.

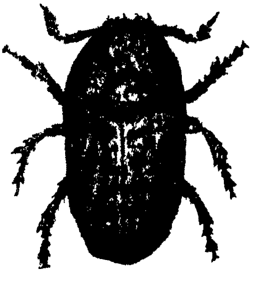

Fig. 70 —*Hylesinus fraxini.* Female, magnified 10 times.

Distribution.

The distribution of this beetle extends over practically the whole of Europe, and, according to Eichhoff,[1] an apparently identical species occurs in California and North America. In Great Britain it is probably the most common bark-beetle living in hard-woods, and is particularly numerous in the Midlands and south of England.

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[1] Die Europaischen Borkenkafer.

Life-History.

After hibernating in the bark of standing trees, the parent beetles begin to seek material in which to breed in the latter part of April or beginning of May, according to season or situation. This material is usually the trunks of freshly felled trees and branches up to 1 inch in diameter, when such are close at hand, or when these fail, the trunks and dying branches of old or sickly trees. No instance has been recorded of this beetle breeding in the trunks of healthy trees, but Altum believes that the weakly branches of healthy trees are attacked, and from these other parts of the tree are invaded. Concerning the actual state of health of the branches at the time of attack a great deal of doubt must always exist, but that the beetle does breed in the tops of healthy trees may be considered beyond question. When the enormous number of beetles which appear every autumn are considered, it is obvious that other breeding-places must exist beyond the trunks of felled or dying trees. We have repeatedly examined isolated park trees, far removed from any felled timber or dead or dying trees, and in September and October large numbers of beetles may be found in the trunks in their hibernating galleries. We have counted as many as fifty to the square foot of bark surface, and in old trees with rugged bark a larger quantity may be present. In woods, again, in which no ash has perhaps been felled for several years, no sooner are a few trees cut, and allowed to lie in the wood until May or June, than thousands of beetles occupy every available inch of bark for boring their mother-galleries. The presence of the beetle in such numbers proves conclusively that a large quantity of material must have been available for breeding during the preceding summer, and in many cases this could only have been found in standing trees. The belief that the beetle attacks more or less healthy branches has a great deal in its favour, therefore, beyond the fact that branches may be found with the working of *H. fraxini* upon them.

So far as felled trunks are concerned, and which are the principal breeding-places upon which our observations have been made, the mother-beetles may be found crawling on the surface of the bark in large numbers on sunny days at the end of April or beginning of May. On warm sunny slopes swarming takes place a week or ten days earlier than on cold shaded places, and cold wet weather may be the means of still further prolonging the period on the latter sites. After crawling about for a day or so the female beetle begins boring her gallery in a sloping direction into the bark, usually at the bottom of a bark fissure, and pointing towards the top-end of the tree, and almost invariably parallel to its long axis. After reaching the surface of the wood, the gallery proceeds for a short distance (about an eighth of an inch) in the same direction, and then branches off nearly at right angles to the right and left (figs. 71 and 72). This forking of the gallery appears to mark the pairing of the beetle, for the male is rarely if ever present in the gallery until then, nor are eggs to be found in the previously formed part of the gallery. After pairing, which takes place at the mouth of the gallery, *oviposition* and the boring of one arm of the gallery proceed simultaneously. The eggs are white and roundish, and are laid in specially prepared niches on either side of the gallery, which in some cases are separated by a considerable intervening space. The eggs vary in number from 20 to 60 in each arm, and are packed in by dust from the gallery.

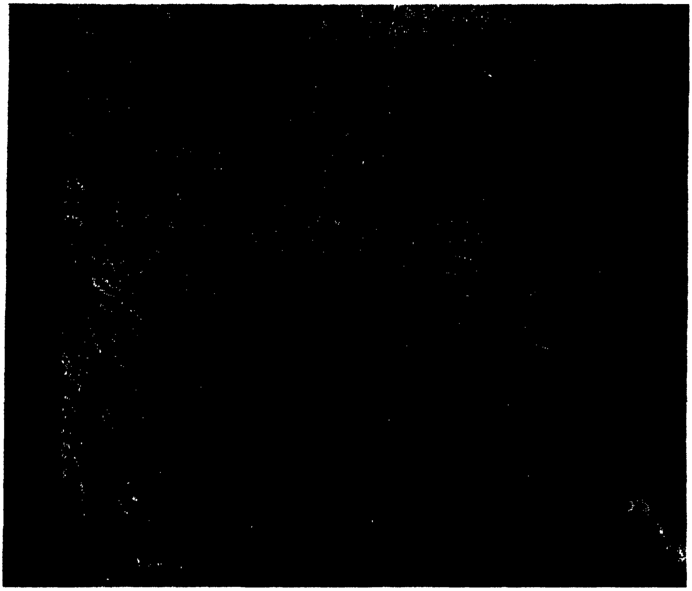

Fig 71.—Portion of young ash trunk with workings of *H. fraxini*, ¾ nat. size.

After the completion of one arm the other is bored out until the two have a length of 2 to 4 inches, according to age and thickness of the bark and the space available. Under thick bark the galleries run chiefly in the bast, eating only slightly into the wood, and are then long and straight. Under thin bark, on younger wood, they are shorter, and eat more or less deeply into the wood, the object of the mother-beetle being the placing of her brood beyond climatic influences as much as possible.

The same conditions also determine the shape and direction of the mother-galleries considerably. When running in the bast they run both in the same line, and the common entrance-gallery is hardly perceptible on the wood, and in some cases may be placed entirely in the bast together with the forked portion, and the two arms have then apparently no connection with each other when seen on the wood. In thin-barked wood the arms of the galleries are more or less oblique, and meet at an angle of varying degrees, occasionally forming with the short entrance-gallery a Y. The oblique direction of the galleries under thin bark is probably owing to the greater ease with which the wood fibres are gnawed when so attacked. Knots and burrs in the wood also cause the galleries to deviate more or less from the horizontal form, and in crowded bark the efforts of the mother-beetle to avoid neighbouring galleries causes turns and twists as shown in fig. 73.

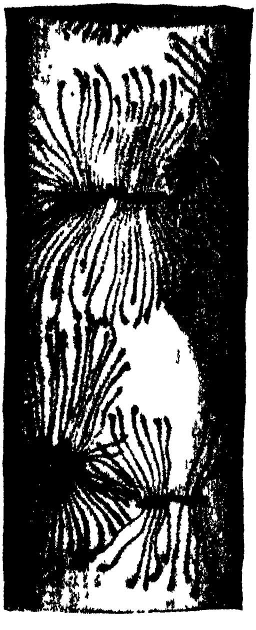
Fig. 72.—Workings of *H. fraxini*, ½ nat size.

During the formation of the galleries the male is usually present, sometimes with the female, and sometimes in another gallery, and appears to occupy his time in keeping the galleries clear of dust. The time occupied in oviposition appears to be from six to eight weeks, and probably varies with the crowded or otherwise state of the bark. After its completion the parent beetles usually die in the mouth or end of the gallery; but, in many cases observed by the writer, holes were bored at the end of the galleries by the mother-beetles, apparently for exit purposes. These holes resembled those made by the new generation when viewed from the exterior of the bark, but careful examination revealed the fact that they were always connected with the mother, and not the larval galleries. Possibly they were made to facilitate the removal of the dust when the mother-galleries were long, and ran perpendicularly down the sides of the trunk, along which they were chiefly observed.

The Larvæ.

The eggs hatch out in a few days after being laid, the young larvæ at first being reddish or purplish. They are legless, furrowed transversely, and taper to a point at the tail. The head and jaws are brown. They cut out more or less parallel galleries at right angles to the mother-galleries at first, and then gradually spreading out at either end of the latter as they increase in size and require more room. When completed these galleries are from 2 to 4 inches in length in normally developed broods, but in crowded bark may not exceed half an inch in a definite direction, after which they are compelled to intersect those of adjoining broods (see fig. 73). When eating deeply into the wood under thin bark they are often wonderfully close and uniform in length. The larvæ usually feed for about ten weeks, and then bore a pupal chamber in the bark, when the latter is thick, or in the wood under thin bark.

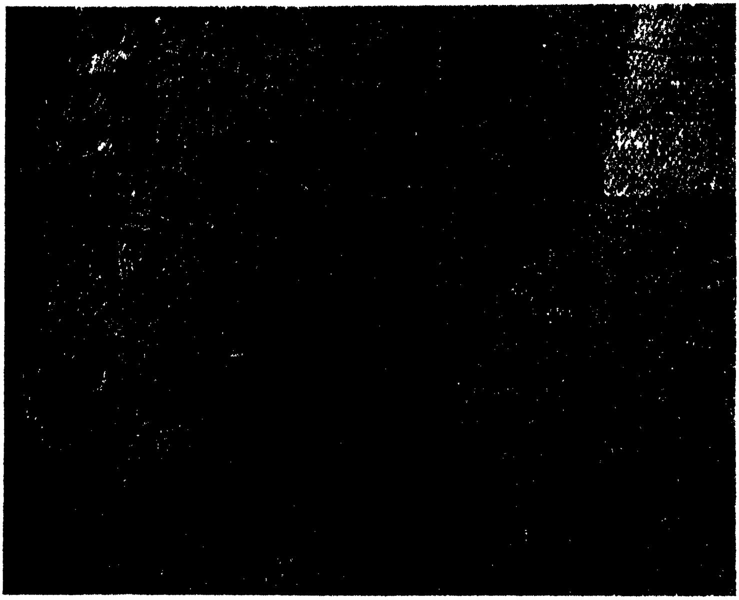

Fig. 73 —Ash bark with workings of *H. fraxini*, ¼ nat. size.

The young beetles begin to appear about the beginning of August, living under the bark several days before boring their way out. They are darker than older beetles, the grey scales not developing for a few days.

Hibernating Galleries.

After boring their way through the bark, the young beetles at once take up their winter quarters in the nearest standing trees, or occasionally in felled trees which are still fresh under the bark. These winter quarters are formed by boring galleries in the bark to the bast, and in which the beetles feed and find shelter throughout the winter. They run in a curved upward direction, and are most frequently formed at or near the base of old thick-barked trees, but may also be found in young ash, twenty or thirty years of age, and with comparatively smooth bark. Their length varies from one-fourth to one-half inch, but they rarely extend more than one-eighth of an inch below the surface of the bast.[1] These galleries are formed not merely for shelter, but also as sources of food during the late autumn and spring months, and it is only during severe weather that the beetles are actually dormant. In March and April they begin to feed actively again, as may be seen from the dust thrown out from the galleries. The latter are frequently occupied by more than one generation of beetles, in which case the galleries are considerably lengthened and frequently widened out at the entrance.

Number of Generations.

According to Eichhoff, Altum, &c., *H. fraxini* is considered to have a double generation, the one swarming in April and May and the other in July. Observers in this country, however, generally agree in giving the beetle a single generation, and so far as this district is concerned the latter view is undoubtedly correct. From carefully observed felled trunks, which were attacked the last week in April 1898, the first date on which the flight-holes of the new brood were observed was the 10th of August. These trees were lying on a warm sunny bank, and had the weather in their favour for speedy development. This same date is also mentioned by Miss Ormerod as that of the appearance of the first beetles from attacked trees in the Thames Valley.

In the former case the appearance of the new brood and the boring of winter galleries in adjoining standing trees coincided, proving conclusively that no attempt at a second generation was made. In the hot dry summer of 1896 holes in felled trunks, resembling flight-holes, were noticed at the end of July; but the occurrence of holes at the end of the mother-galleries recorded above renders this observation of doubtful importance.

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[1] The writer has found *fraxini* forming hibernating galleries under dead bark similar to mother-galleries (see *H. crenatus*).

Moreover, the average date of the appearance of the new generation is much later than that mentioned above, for the larvæ from eggs laid at the ends of the respective galleries are necessarily later in pupating than those from the first-laid eggs, and appear several weeks later as mature beetles, and it is usually October before the entire brood have left their breeding-place.

Late Swarmers.

This term is usually applied to those beetles which swarm considerably later than the average, and in this case late swarmers may be observed in July, although this month must be considered exceptionally late. Large numbers, however, swarm in June, but it is possible that some of these may be beetles which were not at first able to find suitable breeding material. In a felled tree lying in a damp situation a number of galleries were commenced in May, but abandoned before any eggs were laid, and a certain number of late swarmers probably arise from this cause. The majority of late swarmers, however, are caused by the slow development of those larvæ which feed in thickly infested bark, and which are unable to obtain their proper supply of sustenance. Such larvæ may still be found as such in the winter months, and probably have no economic significance.

In the case of this species, which hibernates as the mature beetle, the true explanation of late swarming must be looked for in the sexual development of the insects, which in badly nourished individuals is later than in strong well-fed insects. These late swarmers have possibly something to do with the theory of a second generation, unless climate exerts a greater influence upon the development of the beetle in Germany than with us.

Economic Significance.

The injuries inflicted by *H. fraxini* upon ash-trees may either arise from the boring of the winter galleries, which are almost invariably made in standing trees independently of age or health, or may follow the work of the parent beetles when boring the mother-galleries, and in the subsequent feeding of the larvæ. The boring of the hibernating galleries is usually considered of little economic importance, owing to the fact that they do not extend to any great depth into the bark, and never deep enough to injure the cambium below. This is undoubtedly the case, but it is also probable that the annually recurring attacks of hundreds of beetles upon the same tree—as many as fifty to the square foot—may have a certain injurious effect upon the tree, especially when the growth of the latter is slow. In vigorous healthy trees they probably do little or no harm, as the rate of bark-growth will exceed, or at any rate equal, the loss occasioned by the beetles. In thin-barked trees, however, such as those under forty years of age, the injury will probably be more serious where the beetles are in large numbers, and have no alternative but to hibernate in trees of this age.

It is, however, from the breeding-galleries—mother and larval—that the most serious injury is to be feared. As already said, perfectly healthy bark is rarely if ever attacked, and a certain degree of bad health must precede the beetle attack and bring the bark into that condition which is suited to the requirements of beetle and larva. In the crowns of old and middle-aged trees, however, branches are continually being killed off by shade or injured by wind and storm, and in these the beetles find congenial breeding material, and, when once established, extend their operations year after year until a good deal of the crown has been killed or its destruction hastened. Its presence, therefore, is always a source of danger to old and middle-aged trees, or to young trees in indifferent health, and should not be neglected because fatal results are seldom seen.

Another direction in which injury may be caused, although of a more technical nature, is in destroying the bark of trees which are lying in the timber-yard or depot to season. The immense number of beetles and their larvæ loosen every inch of bark from the surface of the wood, and although the outer portion or true bark remains more or less intact for a time, yet the first crack for any length of its surface soon causes it to peel off and leave the wood exposed to the weather. Ash timber so exposed cracks and opens up with the sun, and into these cracks rain and the spores of fungi enter and deteriorate the timber. This injury more closely concerns the timber merchant or converter than the forester, but is nevertheless of sufficient importance to mention.

Preventive Measures.

The measures of prevention practicable or advisable depend a great deal upon the class of tree attacked and the value placed upon it as an arboreal specimen. When the trees in woods and plantations are seen to be dying off in the upper branches, and their age and size are such as to give them their maximum technical value, the best plan is to have them felled in February or March, and removed from the vicinity of the wood in June or July. By leaving them on the spot until these months, they are available to act as "catch-trees" or breeding-ground for that season's breed of beetles; and by clearing them away before August, they take with them the young generation, which would otherwise hibernate in the remaining trees, and perpetuate the injury the following year. The technical value of the ash does not increase, and usually decreases after the seventieth or eightieth year, and it is better to cut trees of that age than to leave them for further attack and deterioration. Where a young plantation is suspected to be suffering from beetle-attack, however, and it is desirable to reduce their numbers, a few of the worst trees may be cut and dealt with as recommended above, the number cut being regulated by the numbers of the beetles present, which may be judged to some extent by the hibernating galleries of the autumn previous. This is by far the simplest and best way of dealing with them, and can be effected without any extra expense or labour. Of course the subsequent destination and disposal of the infested trees is of importance from a general point of view, as, if removed to the neighbourhood of other ash plantations, the young generation simply change their quarters unless promptly dealt with and destroyed.

When the timber is removed a considerable distance—a mile or more—from plantations or ash-trees, this alone is probably sufficient to seal their fate, as observations made on timber occasionally felled in isolated situations inclines us to the belief that this and other bark-beetles have very limited flying powers, probably not more than 200 or 300 yards at the most, although wind, weather, and species may all tend to modify this statement. When, however, the timber cannot be removed to a safe distance, the larvæ can be destroyed either by stripping off and burning the bark, or, when this is objected to on technical grounds, the trunks can be smeared over with some sticky substance which will hold the beetles and prevent them from making their escape. A mixture of cow-dung, clay, and tar will serve the purpose as well as anything, applying it with an ordinary tar-brush early in August. To facilitate this process the trees should be deposited 2 or 3 feet apart on the ground, so that room exists for passing between them and smearing the whole surface of the bark.

In the case of old ash in parks and pleasure-grounds which it is desired to preserve as long as possible, the beetles may be caught by leaving ash logs beneath them for breeding purposes on the same principle as described above, and similar to the plan adopted in the case of all bark-beetles.[1] A great many may also be caught in their winter quarters by smearing the trunks with a sticky mixture such as that described above, caterpillar-limes, &c.; but as the beetles hibernate in all parts of the tree provided with thick or rough bark, this plan is both tedious and unsightly, and is more or less impracticable.

[1] Trans. H. and A. S., vols. iii. (1891) and viii. (1896), 5th series.

In a general way the attacks of this beetle could be greatly reduced if the practice were generally adopted of insisting upon all felled ash timber being cleared away from woods and parks before the month of August, and by regularly removing dead or dying ash-trees, which serve as resting-places for successive broods. In healthy young plantations little damage need be feared from the beetle, but in middle-aged and old woods it invariably continues its ravages more or less unnoticed until the attacked trees are past recovery.

3. HYLESINUS OLEIPERDA, *Fabr.*

Characteristic Features.

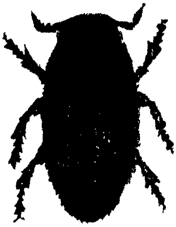

Fig. 74.—*Hylesinus oleiperda.* Female, magnified 10 times.

This beetle (fig. 74) is bluntly ovate, pitchy black, and covered with yellow bristles and hairs. The pronotum is broad at base, tapering towards the head, with bluntly-pointed tubercles on each side in front, and a curved, oblique, smooth, depressed line on each side of the scutellum at the base; the remainder being wrinkled and punctured. The wing-cases are marked with punctured lines, with broad tubercled interspaces, flattened near the hinder part, and only slightly rounded at the base; adjoining edges of wing-cases covered with long yellow bristles, with no mottled markings. Length about one-tenth of an inch. Legs and antennæ yellowish.

The males are rather less bristly than the females, and have the edges of wing-cases almost bare.

Distribution.

According to Eichhoff, this beetle ranges over Middle and Southern Europe, and is found as far north in this country as the south of Scotland,[1] and throughout the whole of England, being usually associated with *H. fraxini.*

Life-History.

H. oleiperda is entirely confined to the ash in this country, but in Southern Europe it also feeds upon the olive (whence its name), and beech and syringa are also said to be attacked by it.

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[1] Fowler's Coleoptera, vol. v.

The beetle swarms in the south of England in July and August, and the mother-beetle selects the small twigs of standing ash, varying in size from the shoots of the last season's growth to those of an inch or so in diameter in the case of comparatively healthy and growing trees, but in dying trees branches up to a foot or more in diameter may be selected. We have also found it on coppice shoots, but it does not appear to attack timber of large size or that covered with very thick bark.

In the case of standing trees the mother-beetle usually selects twigs which are dead, but comparatively sound and fresh, and generally begins her gallery at the fork of a twig, or upon the rough bark covering a wound, broken shoots, &c. The mother-galleries are two-armed, comparatively broad, and cut deeply into the wood, and are occasionally widened out here and there into bays or short arms near the entrance (fig. 76). The entrance-gallery in small twigs is comparatively long, and occasionally exceeds in length one of the arms, giving the working a three-legged appearance. The arms seldom exceed half an inch in length in small wood, or an inch in larger material, and usually run obliquely across the grain of the wood in the former, and at right angles to it in the latter material. The number of eggs laid in each arm vary from ten to twenty, and are placed comparatively close together. The larvæ are marked with pink lines near the tail, and eat deeply into the wood. At first, their galleries are comparatively parallel, and in some cases continue so for a great length; in others, again, they soon cross and become irregular and confused, and never exhibit that regular pattern on the wood characteristic of *H. fraxini*. The great feature in the workings of *oleiperda* is the great length of the larval galleries, running in most cases to 6 or 8 inches, and in some much more.

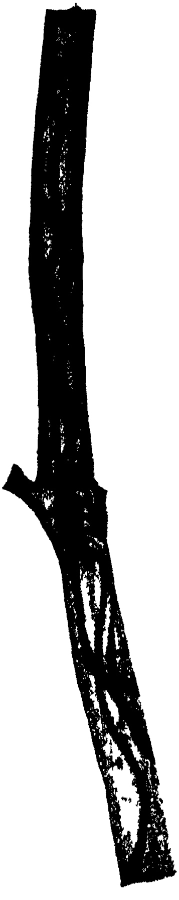

Fig. 75.—Workings of *H. oleiperda*, nat. size.

The larvæ are usually half grown by October or November, and feed more or less throughout the mild portion of the winter. Many swarms are later than this, however, and it is common to find eggs as late as October which have been laid by late swarmers. The larval galleries shown in fig. 75 were in a branch blown off from a healthy young ash.

Economic Importance.

The generally accepted idea with regard to this beetle is, we believe, that it breeds only in dead and rotten wood. Our own observations, however, do not bear this out altogether, although it does breed in such material to some extent. We have met with it in dry material which had evidently been dead for months; but its more general breeding material appears to be wood which is still green and fresh, such as recently blown-off branches, dying shoots, &c., which still retain moisture enough to give the bast a fresh appearance. Perfectly healthy twigs may also be found eaten into for a short distance, and there is little doubt that a very slight injury or want of vigour may be sufficient to invite attack from the beetle.

The great length of the larval galleries also lends itself to the probability of these galleries extending from dead into living tissue, where mother-galleries have been formed in the former. In this way the destruction of previously healthy wood may be brought about, and in our opinion the work carried on at a later stage by *H. fraxini* is begun by *H. oleiperda.* In the south of England scarcely a middle-aged or old ash can be found in which this beetle is not present, and for every one found in twigs on the ground, large numbers must be present in the crowns out of sight and reach, and this is probably the reason this species has escaped much of the notice it would otherwise have received.

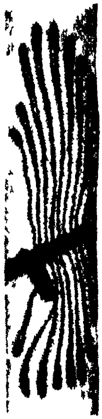

Fig. 76. — Unfinished workings of *H. oleiperda* in ash twig, end of October. Nat. size.

Preventive Measures.

Much of what was said in this connection of *H. fraxini* is applicable to this beetle, with the exception that felled timber of large size is of little use owing to its habits and choice of material. The best catch material is the small branches and prunings, which can always be obtained without damaging the trees; and if these are allowed to lie until September or October, they will contain a large number of the new generation. They can then be tied up into faggots and used as firewood and for other purposes before August of the following year, and the larvæ they contain thereby destroyed.

PIGS ON THE FARM.

By SANDERS SPENCER, Hollywell Manor, St Ives, Hunts.

THERE would appear to be several reasons for a considerably increased amount of attention being paid to the pigs on the farm than has been general, particularly in North Britain. The enormous increase in the importance of the dairying industry, consequent on the much larger consumption *per capita* of milk, butter, and cheese by our rapidly increasing population, is perhaps one of the chief of these reasons. The manufacture of milk results in by-products—or, as these are more commonly termed, dairy offals—which are profitably utilised by pigs; whilst the enormous increase in the consumption of mild-cured bacon and hams has opened up a market for the disposal at good prices of almost any quantity of fat pigs of the correct type, form, and quality—particularly if the pigs have been partially fed on dairy offals.

Pig-rearing in Denmark.

That little country, Denmark, with a population less than that of London, affords a remarkable instance of the value of dairying combined with the breeding, fattening, and curing of pigs. Several inhabitants of and residents in Denmark, who have for years visited England to buy breeding pigs, have frankly admitted that their country has received a wonderful impetus during the last twenty years from the manufacture of butter and cheese, which could not have been profitably carried on without the aid of the descendants of pigs bought in England to consume the skim-milk, butter-milk, and whey. So many and great have been the benefits derived by the Danish farmers from these combined industries that, instead of being affected by the low prices of most agricultural produce, they have actually improved their financial position.

It may be asserted that the farmers in Denmark do not owe their comparative prosperity to the production of milk and pork alone, but to a certain extent to a share in the manufacture of butter, cheese, and bacon by the co-operative societies, and to the very valuable aid which they have received from their Government. Even if this contention be a valid one, does it not go far to prove that we farmers in the British Isles have not taken full advantage of our opportunities in the way of combination and of co-operation?

Farmers have always been charged with a want of that cohesion which has proved of so great benefit to the members of all other trades. If they would but combine, their numbers and power are so great that they could force the Government to carry out any beneficial and necessary work. What other trade would meekly submit to the unprecedented amount of adulteration which is continually being carried on in dairy products, adulteration which has gone far to cripple those farmers who have made dairying their chief study?

It has been said that State aid has the effect of checking individual effort. It may perhaps have that effect to a limited extent, but it would be sorry consolation to the friends of a drowned man to be told that no effort was made to save the drowning man lest that noble quality, self-help, should not be brought into play. Anyway, the Danes have had State aid, and they have had co-operation, and they have improved their pigs to such an enormous extent that Danish bacon has recently been quoted at a higher price on the London market than Irish. If any one had, ten years since, prophesied such a state of affairs, he would promptly have been declared to have qualified for a lunatic asylum.

The Irish may, as they do, declare that they do not fear the Danish competition, as in the course of a very few years' time the Danish pigs will lose their high quality for the production of the best bacon. If our Irish farmers and bacon-curers are trusting to this, they are leaning on a broken reed, as after the Danes will come the Canadians, and these in turn will be followed by improved American pigs.

If we in England are to hold our own in the production not only of the best pork and bacon, but of the highest agricultural produce of all kinds, we shall have to pay more attention generally to the breeding and feeding of our stock on commercial lines. Undoubtedly we have very great advantages in climate and soil, and in that our foreign competitors must occasionally resort to the British Isles for "refreshers" of pure-bred stock for breeding purposes. Still the tendency among far too large a proportion of the breeders of pure-bred stock is to study fancy points, giving these the most marks in competition instead of first honouring the useful qualities, and if an equality then be found in animals competing, giving credit for those points which are more or less of a fancy character. We must not forget that the object of raising stock is to furnish the inhabitants with wholesome meat, suited to the wants and necessities, and sometimes, to a limited extent, to the fancies of the consumer; and further, that unless we produce this kind of meat at a reasonable cost it will be supplied by stock-owners of other countries. This applies more directly, perhaps, to pork in its various forms than to the other kinds of meat, since pigs are less affected by climate, and also from the fact that the same or nearly the same kind of food is procurable in well-nigh all parts of the world.

The Pig Industry Abroad.

In this country we appear to have little idea of the immensity of the importance of the pig in various foreign countries and even in some of our colonies. What should we in England think if it were announced in one of our stock papers that one of our firms of bacon-curers had despatched from their factory £10,500 value of bacon in one day, as was recently done in Canada, or that one firm had bought in one week 54,000 fat pigs, as did Armour & Co. of Chicago—and still further, that in one year over 22 million pigs had been slaughtered and packed in some seven or eight centres in America? There is little doubt that by the conversion into pork of the cheap foreign feeding-stuffs with which our markets are inundated, we should not only add to our shekels, but also increase to an enormous extent the fertility of our lands.

The fruit and hop growers are becoming alive to the value of pigs as manurial agents. The pigs are kept in the orchards, fed on imported feeding-stuffs, and produce pork of the finest quality, and at the same time cause largely increased yields of fruit, whilst the herbage is vastly improved. Many of the expenses attending the fatting of sheep and cattle are saved, whilst the consumption of corn in the orchards by pig fatting may be almost unlimited.

The manuring of hops, and indeed of every plant capable of assimilating a great quantity of manure, is, by the droppings of pigs, found to be both profitable and efficacious. There is little doubt that pig-manure would be found to be most effective in the growth of potatoes, whilst the fatting pigs will give the best return from the consumption of the small potatoes if these are previously steamed or boiled and fed with some of the cheap imported corn. In passing, we might remark that experiments carried out in Denmark proved that boiled potatoes, when fed in connection with grain, skim-milk, or whey, equalled in feeding value one-fourth as much as corn; or, to put it in another form, that the same increase was obtained from the consumption by fatting pigs of 4 lb. of boiled potatoes as from 1 lb. of corn. This shows that a good market can be found for the disposal of the potatoes too small for seed or human consumption; and, of equal importance, it was proved that the pigs fed partially on the cooked potatoes and dairy offals produced pork of as fine quality as corn-fed pigs.

It is impossible, in the space at our disposal, to marshal all the numerous facts which go to show that if only an equal amount of attention, foresight, and industry were bestowed upon the breeding and fatting of pigs as is lavished upon horses, cattle, and sheep by farmers in the North, an equal amount of success and honour would be realised, and that North Britain would soon claim a very large share of home and foreign customers for its pigs, as it already does for its other kinds of farm stock, which are proved to be second to none in the world.

Breeds of Pigs.

It is not uncommon with writers, when attempting to give a description of the points usually prominent in the different breeds of a certain variety of stock, to give the place of honour to that breed which has been established for the longest time. This course might have been followed now, and we have the most convincing evidence of the particular kind or kinds of pigs which have for the. longest time been bred to colour, if not comparatively free from out-crosses; but as we are anxious to avoid the slightest possibility of laying ourselves open to the charge of partiality, we will follow the alphabetical order of the few breeds of pigs which, in the British Isles, are looked upon as pure breeds. We thus assign the post of honour to the Berkshire.

BERKSHIRE PIGS.

It would, perhaps, be somewhat difficult to discover exactly why the old-fashioned black-and-white and sandy-spotted pig first obtained this name, as in portions of several other counties —such as Oxfordshire, Northamptonshire, Leicestershire, and Bedfordshire—large numbers of these parti-coloured pigs were bred about the middle portion of this century. Opinions differ as to the origin of the breed, but credence is generally given to the statement that it was a compound pig, in which was intermixed varying proportions of the rusty-red pig which is now called the Tamworth, a black pig into which had been infused a good deal of Neapolitan blood, and a certain proportion of blood from the somewhat coarse white pig found in Bedfordshire and near by in the earlier part of the century. The result was a long-bodied, deep-sided pig, of a spotted colour, the lighter bodied and more leggy pigs having short, and more or less erect, ears, whilst the thicker fleshed and slightly coarser pigs possessed drooping ears and heavy bone, with thicker skins. The sows were generally very prolific, and good sucklers, but rather savage, so that it was found advisable to give them plenty of food, and as wide a berth as possible. The little pigs were hardy, and soon able to take care of themselves. As early maturity was not much studied in those days, the pigs were run on as stores for many months before being fattened; consequently the fat pigs were large and heavy, and not free from coarseness.

This style of pig and system of management not lending themselves to the early-maturity fashion which set in, pigs of a finer quality, and of a smaller size, became fashionable. There are diverse opinions as to the means adopted by the different breeders of these pigs, which had now been dubbed Berkshires, in order to bring them into line with the requirements, real or fancied, of the age. The selection of the neatest and smartest boars and sows — especially those of a dark colour, and free from the sandy and white spots—is said by some persons to have been the plan followed; whilst other equally, and perhaps better, informed authorities declare that the blood of the Small Black pig, which had been brought to great perfection as a neat, fat-forming pig, was introduced. The result was a pig of fine quality, shorter in head, back, and leg, but with a reduced proportion of lean to fat. These pigs were somewhat slow growers in their early life, but would fatten quickly after becoming some six months old. The sows would breed fair litters of pigs, but they were not, as a rule, particularly good sucklers. The breeders or fanciers of Berkshires subsequently determined that preference in the showyard should be given to pigs having black skins, with a white mark on their foreheads, white toes, and white tips to the tails.

This decision was improved upon or the reverse, as outsiders generally held, by the members of the British Berkshire Society following the lead of the American breeders, who had agreed that the want of these so-called white markings should disqualify a Berkshire pig in the show-ring. Personally we believe that this decision will tend to injure the Berkshire for utility purposes, since most of those pigs which are deficient in the white markings, or possess too much white on other parts of the body, are frequently the best formed and most hardy of the litter; and further, these white markings are not natural to the breed. Of course this, like any other peculiarity, can be ingrafted on to a breed of pigs, but at what cost we hesitate to define. At the present time there cannot be produced in any fat stock showyard a more handsome pen of fat pigs than a well-fattened pen of Berkshires. A capital specimen of the Berkshire breed is represented in fig. 77.

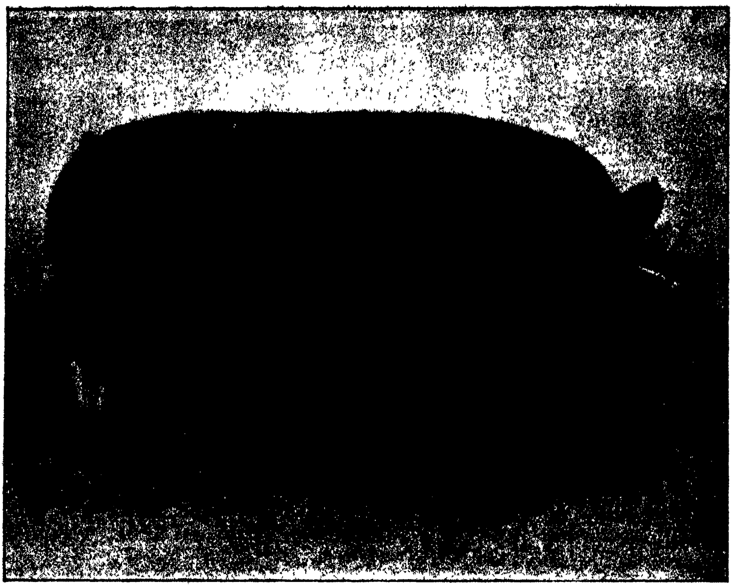

Fig. 77.—Berkshire Boar, "Peel Swansea" 6231.

The property of Mr J. Jefferson, Peel Hall, Chester, and bred by Mr E. Burbidge, South Wraxhall, Bradford-on-Avon. Winner of numerous first and champion prizes.

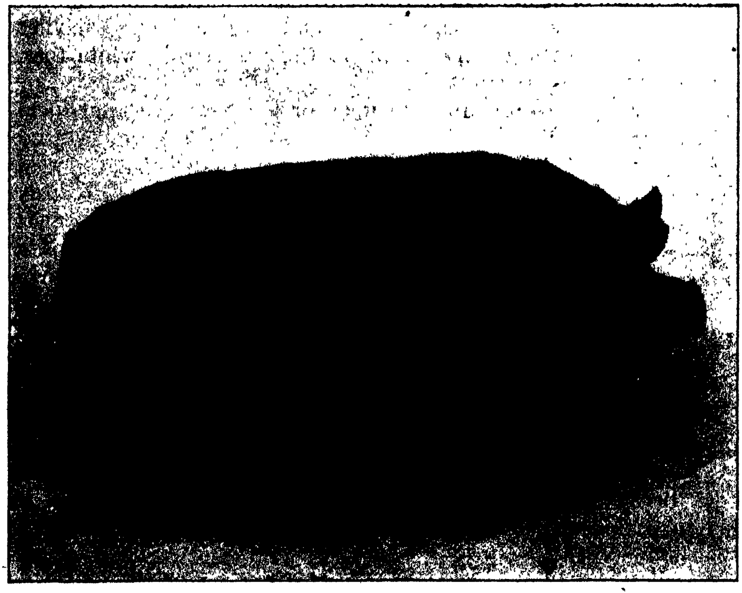

Fig. 78.—Small Black Boar, "Nonsuch."

Bred by, and the property of, Mr George Pettit, Friston, Saxmundham, and winner of first prize at Royal Show, Leicester, 1896.

SMALL BLACK PIGS.

The Small Blacks, or, as they are sometimes variously termed, Essex or Suffolk Blacks, at one time held a high position as fat-formers on little food and as London porket pigs. But here again fancy fastened on to the variety, with the natural and inevitable result—so great a decrease in public favour that the variety has almost ceased to exist in its purity. The present breeders can be counted on the fingers of one hand. The pigs are all black, fine in hair, skin, and bone, very pretty, but of little value for pork purposes with the present public taste for lean and firm meat. A typical Small Black pig is represented in fig. 78.

SMALL WHITE PIGS.

Except as to colour, which should be a pure white without blue spots on the skin, the description of form and qualities applied to Small Black pigs would suffice for pigs of the Small White breed. In years gone by this variety of pig was very successfully bred in Essex and Suffolk. Now these districts know them no more; in fact they have ceased to have any commercial value.

MIDDLE WHITE PIGS.

The Middle White pigs have quite taken the place of the Small Whites as producers of neat joints of fine quality, possessing a considerable portion of lean meat to fat. Indeed it is claimed for them by some enthusiasts that they are in some places actually taking the place of pigs of another colour.

The Middle White sow makes a capital mother; she is docile, prolific, and a good suckler. The little pigs are generally very robust, grow quickly right away from the time of weaning, and come early to maturity if required for the manufacture of small pork pigs, or, as the Londoners call them, porket pigs. Pigs of this breed will grow to a good size, and furnish fat pigs quite as large as the butchers require them to be to satisfy the present demand of their customers, and it is very probable that a well-bred Middle White pig will produce as great an increase of fine-quality pork from a given quantity of food and in as short time as will a pig of any other breed.

Boars of this breed are very commonly used for crossing on sows of other breeds when the object is to produce pigs which will both mature early and make fair growth.

The colour is white, with occasionally blue marks on the skin;

the head is short in proportion to the length of the body, which should be deep and well let down in the flank; the hindquarters should be long and square, with meat down to the hocks; the bone and hair should be fine, and the legs placed well outside the body. Before the establishment of the herd-book for pigs some of the exhibitors won numbers of prizes in the classes for Middle Whites with pigs the produce of Large White sows and begotten by a short-headed Middle White boar, and occasionally a Small White boar would be used. The shortest headed of the pigs so bred were exhibited, and would often be placed before pure-bred Middle Whites because of their greater size. The condition which is now enforced at some of our most important shows, that the pigs exhibited should be eligible for the herd-book, has had a most salutary effect in rendering the pigs which are exhibited to be more of the same type and character. Even in this particular, however, there is still room for that improvement which will certainly follow the persistent appointment of judges who know the points of a Middle White.

LARGE WHITE PIGS.

It has been said that no breed of pigs has been more improved during the last quarter of a century than has the Large White (fig. 100, p. 368). There is little doubt that in the sixties, and even at a later period, the Large Yorkshires, as they were then generally called, were inclined to be coarse in bone, hair, and flesh; then for a period their breeders paid far more attention to quality than to size, with the result that some fifteen or twenty years ago it was not uncommon for so-called Large White pigs to be successfully exhibited in early life in the classes for Middle Whites, and then as they arrived at maturity to win prizes even at the Royal Show as Large Whites.

There is little doubt that prior to the establishment of the herd-book some fifteen years since, it was a very common practice in the North of England to cross all three of the breeds into which the Yorkshire Whites have been subdivided. By this means some extraordinary specimens of the *genus* were produced; but, as was to be expected, the produce of these successful exhibition pigs varied greatly, even those pigs of the same litter being very dissimilar in size and character.

Another factor in determining the form and character of the now called Large Whites was the movement on the part of the leading bacon-curers against the fat-lard pig, and the heavy coarse-boned pig. An attempt, and a most successful one withal, was made by certain prominent breeders of Yorkshire pigs to produce a pig long and deep in body, well developed in flank and ham, light in the head and forequarters, and on short legs, with strong flinty bone. Pigs of this description have been largely exported, and are still in numbers being shipped to foreign countries, where they have proved a complete success, as they cross well on the pigs of all countries, and impart to their produce in a marked degree their good qualities, especially that of prolificacy, for which they are justly esteemed.

It is believed that quite recently an attempt has been made by some of the breeders of Large Whites, whose stock have not proved so great a success abroad, to somewhat alter the character of the Large White pigs, giving as their ostensible reason that a pig called Large should, above all things, possess size. This argument may be theoretically sound, if it be possible to define the limit of their ambition for mere vastness; but it is feared that much harm will result to the breed if, by striving after fancy points, the commercial points of the Large White pig are only partially lost sight of. It matters not what the variety of domestic animal may be which we are cultivating for profit, its suitability for its ultimate purpose, the furnishing of meat of fine quality for the public, must be the chief consideration. If, as is stated, this tendency to spoil the useful Large White is becoming general, then, for a time, pigs of this breed will be much less sought after by practical men than fortunately has been the case during the last fifteen or twenty years. Complaints of this retrograde step have been made by both Canadian and Danish buyers during this last summer, and a declaration has been made that they will cease to import the big ungainly brutes which some few fancy breeders are endeavouring to make fashionable.

TAMWORTH PIGS.

Another breed of pigs which have been vastly improved of late years is the Tamworth (fig. 79), a pig with red hair, becoming darker with age. The old-fashioned Tamworth pig was of a darker hue, and had black spots on the skin; the head was very long, the ears pricked as with many wild animals; the legs were long and the bone hard, the body of fair length, but the forequarters were much heavier in proportion than the hindquarters; the sows were good sucklers, but somewhat bad-tempered. Many of these points have been vastly improved upon, in some instances by the infusion of outside blood, and also by careful selection.

A considerable number of these improved Tamworth boars have been used on the Berkshire and other black pigs in Wiltshire, Surrey, and in other southern and south-western counties, as well as in Canada. Perhaps greater success has attended the use of the Tamworth pig for crossing on the Canadian pigs for the production of baconers than in any other place. Many of the Canadian pigs were crosses of the Poland China, Berkshire, Essex, Duroc-Jersey, or Chester-White breeds, all of which breeds are noted in Canada more for the production of short thick sides than lean long sides of pork, such as is at the present time most sought after in nearly all parts of the world.

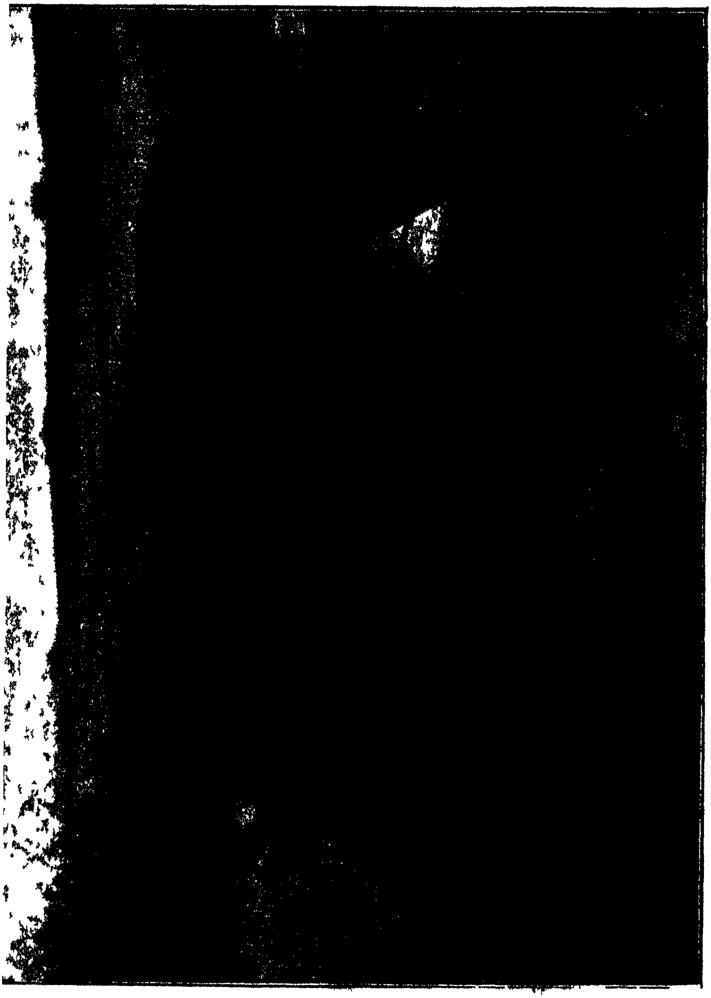

Fig. 79.—TAMWORTH SOW, "WHITACRE COUNTESS 2ND" 7828.

Bred by Mr D W. Philip, Whitacre, Birmingham Champion of the breed at Leicester Royal Show, 1896.

OTHER BREEDS

Besides these breeds of pigs which have herd-books established to register their pedigrees, we have in the British Isles many more or less valuable local breeds. Amongst these local pigs of a white or of a blue and white colour, we have the heavy thick-boned and thick-fleshed pig found in the Fens of the Midland Counties. Some very fine specimens of this breed are to be found in South Lincolnshire and the Isle of Ely, or in those districts where the farmer agrees to supply to his labourers a certain amount of pork each season partly in lieu of wages. These pigs are prolific, quick growers, but somewhat slow feeders when young. They answer to the meal-pail best when they have age on them; but then the carcass is too large for ordinary butchers' trade, or for sending into other districts. At one time the so-called Black Country furnished very good markets for these very large and fat pigs; but even at Hanley, Middlesborough, and other similar centres of the iron industry, smaller joints of pork from younger and finer-fleshed pigs are now most in demand.

Perhaps the best local breed of pigs is the plum-pudding or black-and-white pig still found in Northamptonshire and Oxfordshire, and parts of Leicester and Warwickshire. These pigs, which have recently been bred of a darker colour, or with fewer of the white patches, are very hardy, the sows breed large litters of pigs and suckle them well, whilst the store-pigs also grow fast on coarse food. But here again the present demand for small joints of meat, the produce of young animals, has tended to reduce the value of the spotted pig to the pork producer.

Some of the farmers and pig-keepers in the district referred to have lately been using Berkshire boars on the country sows. This has reduced the size of the fat pigs, and increased the proportion of fat and the aptitude to fatten, but it has also resulted in affecting the prolificacy of the sows and their ability to rear large litters of pigs. Far better results have followed the use of Middle White boars; but the country people object to the colour of the resultant pigs, as these are almost invariably white, and the shoemakers, who are large consumers of meat, are still so benighted as to imagine that the quality of the meat is affected to a very great extent by the colour of the skin of the fat pig, and further, that the pork furnished by a black-skinned pig is of better quality than that from a pig which had a white skin. It is to be hoped that in course of time this piece of ancient prejudice, which is by no means confined to the districts mentioned, will have passed away, as education becomes more general and more practical.

In some of the southern and south-western counties of England much store is set by pig-keepers on the dark-coloured pig, the colour of which varies from a slate to a jet black. There is also an equal variation in the size and feeding properties of the pigs in the different districts. In Sussex, the pigs are of a slate colour, thin in hair, short in legs, long and deep in body, and as a rule prolific; whereas in Dorset, there is said to have been a cross of the Neapolitan pig which has greatly increased the tendency to lay on fat at the expense of the more practical and valuable properties. Still further down, we found, years since, the pigs mainly jet black, of large size, heavy in head, ear, and shoulder, deep in side and rather light in hindquarters. The sows of this breed were very prolific and capital sucklers, and the young pigs grow rapidly; but the fat pigs are not liked by the bacon-curers, on account of their great weight, small proportion of lean meat, and of weight in sides and hams in comparison with the less valuable parts of the carcass.

The counties of Essex and Suffolk were at one time noted for their small black pigs, but these very handsome pigs have not proved their ability to supply the present market demands for early matured lean pork, so that they are gradually becoming scarcer and scarcer. Considerable numbers of Large White boars have, to our personal knowledge, been sent into the Eastern counties, and the effect of the use of these is apparent in the colour and form of the market pigs.

Cumberland pigs were at one time highly valued for their large size, their aptitude to fatten, and their production of large carcasses of fat pork. The hams were carefully cured, and so long as a 40-lb. ham was in demand, the price realised for Cumberland hams was very high; but the 10 to 12 lb. lean ham has quite eclipsed the big fat ham of other days. The consumption of hams has so enormously increased that we import annually hundreds of thousands from the United States, many of which are, it is believed, palmed off on the unsuspecting Britishers as best York hams, or of that kind of ham most popular in the particular district.

So far as our knowledge extends, North Britain has no distinct local breeds of pigs. This is strange when we consider that of cattle and sheep there are several most valuable and perfectly distinct local breeds. It is impossible to foretell how great the advances may be which Scotsmen will still further make in agricultural progress; we may yet welcome a Scotch breed of pigs.

Selecting Breeding Pigs.

There is no doubt that far too little attention is usually paid to the selection of the breeding pigs when it has been decided to keep pigs. For this want of care several excuses are too frequently made. We often hear it stated that the beginner is naturally deficient in knowledge as to the particular kind of pig which is most likely to prove profitable. To our mind this is no excuse at all. A person undertaking any business or calling requiring experience, as does pig-keeping, commits a folly if he embarks in it without a fair share of knowledge, as he is doomed to certain loss, if not complete failure.

Some persons again plead that the difficulty of obtaining good pigs is so great. Surely the period for such an excuse must have passed. The stock shows are now so numerous, and as a rule so well managed, that information is brought home to all those who will take the trouble to seek it. Even if this source be closed to some few persons, we have an agricultural press mainly in the hands and under the direction of capable men, whose sole endeavour is to assist their readers in every department of farming and stock-keeping.

But here again a difficulty arises. Far too few farmers take the trouble to read the agricultural and stock papers. This grievous neglect sorely handicaps the ordinary farmer, who would, by studying the farm journals, discover much to follow, as well as some few things to avoid. He would also, by looking through the advertisement columns, see at a glance the names of those who have stock of the various breeds for sale. Application might be made to owners for prices and references or for *dated* testimonials, when little difficulty would be experienced in discovering whether or not it would be wise to place orders and one's self implicitly into the hands of those persons advertising stock. This last must in most cases be done, as it is generally impossible to inspect the stock before purchase.

The mere winning of prizes at shows, or the fact that advertisers give glowing accounts of their stock, are insufficient in these degenerate times,—the latter is, to say the least, only natural, whilst the former is by no means difficult for persons with money. Again, so many persons about to start a herd give undue thought to the cost of the original foundation stock. They will often purchase breeding animals from a newly-established herd, or from a person whose modes of doing business or whose stock are of so doubtful a character that he can only secure customers by asking a very low price for those animals which he has to sell—prices which are unremunerative to a breeder of really good stock, and one who has a reputation for such to keep up. Our experience is that it is far better to place oneself unreservedly in the hands of a breeder of repute, and owning an old herd, than to purchase low-priced animals from a herd recently established, or from an advertiser or owner of stock in whom complete confidence cannot be placed.

The Variety to Select.

A serious difficulty arises when an attempt is made to give advice as to the best breed of pig to keep, so many circumstances may affect this decision. It will generally be found the wiser plan to start with the kind of pig which is commonly kept in the district, providing it is considered that pig breeding and feeding have received anything approaching that amount of attention from the farmers to which they are justly entitled. This fortunate state of affairs is not by any means general in England, if it be so in the North. Another point to be considered is the market in which the produce will have to be disposed of; nowadays there is far less variation than was at one time general. The enormously large and the very small fat pigs are fortunately things of the past. The public generally also will have lean rather than lard pigs, young rather than old fat pigs.

The beginner must then of necessity breed pigs which are of quick growth and of early maturity, and which furnish the particular kind of meat most in demand in the district in which he is compelled to dispose of his pigs.

Even in this last respect a great alteration has of late years taken place owing to the general introduction of railways into country districts. The ease with which fat pigs can now be distributed about the country tends to put a stop to a considerable amount of that local prejudice as to the kind of pig to be kept in particular districts.

In case it is difficult to find really useful breeding pigs in that particular part of the country in which the would-be pig-keeper is about to settle or has settled, then it will be advisable to obtain a few really good pigs—say a boar and a couple of young sows—from some breeder of pigs whose stock have gained, and have retained for a length of time, credit for their hardihood, prolificacy, quick growth, and early maturity. It will take but comparatively little time to discover their suitability to the district and to the requirements of the persons who purchase the fatted pigs.

By far the more satisfactory plan is to give up a day to inspect the whole of the herd from which the breeding pigs are to be purchased, and then learn as much as possible of the system of management pursued in the herd. We are aware that it is said that some breeders of pure-bred pigs are very reluctant to retail their practises; if this be so, then one need not trouble these over-reserved breeders unless the kind of animals required cannot be found elsewhere. These secret methods have grown quite out of date. In former times many of the old stock men, who had been more than usually successful, would not on any account teach beginners how best to manage their breeding animals, whilst as to giving another person any idea as to the manner of preparing stock for show, such an extraordinary folly would not for one moment be entertained. This may have arisen from ignorance, or an attempt to make the training of show animals—simple a matter as it is—appear to be something wonderful. How little some of the practical stock exhibitors of the present think of the preparation of stock for exhibition purposes can be imagined when an old hand declares that the chief requirements for success are the selection of really good stock, bred from parents which have been of the best for several generations, and then feeding them regularly on sound food *mixed with plenty of common-sense.*

Herein certainly there would appear to lie the essentials of success in stock-breeding and in winning prizes. In no single thing is personal attention to the matter in hand more necessary than in the breeding, feeding, and exhibiting of stock, particularly of pigs, as they are pigs in more senses of the word than one.

Desirable Characteristics in Breeding Pigs.

Amongst the many essentials to be sought for in the stock boar and brood sow is a good temper, or a freedom from viciousness and irritability. It must be remembered that the pig is in its wild state naturally of a somewhat savage nature. This weakness is by no means unknown amongst certain breeds of domesticated pigs, and it is a fault which is very strongly hereditary. A bad-tempered boar is one of the most dangerous animals any one can have on a farm, for, as with a vicious bull, no person or animal is safe at all times from his attacks, which are of a most dangerous character. A bad-tempered sow is also a source of much trouble, and almost invariably a bad mother, as if she farrows a good litter of pigs these are continually being reduced by the sow if anything arises to upset her equilibrium—a by no means difficult task. The produce of irritable parents are almost certain to be possessed of the same weakness, and consequently slow fatteners.

It is also almost impossible to render any assistance to a bad-tempered sow should she need it at time of farrowing. This is frequently imperative in very severe weather, as it is should a false presentation of the pigling be discovered. Some sows and many little pigs are annually lost for the want of a little help in bringing forth a pig; in placing the youngster to its mother's teats, and in the coldest of weather placing the newly born and damp pig into a basket or box in which is placed dry straw. In very frosty weather the wet pig is so chilled in the space of only a few minutes, that unless it be taken into a warm room and given some little stimulant such as gin—or, of course, in Scotland, whisky—the little pigling will refuse to suck, contenting itself with uttering a peculiar squeak and departing this life. Once get a little of its mother's milk into its body, place it in a dry warm place for an hour or two, and then the cold does not appear to have much effect, provided that the sow will rest contentedly and furnishes a good supply of milk.

This brings us to another qualification which the sow must possess, namely, the ability to secrete milk freely, and for at least six weeks. One of the chief causes for the many uneven litters of pigs far too common about the country, is the want of a regular and continued supply of mother's milk. It is generally thought that it is impossible to form any opinion from the mere inspection of a yelt as to whether or not she will prove a good milker, but there are certain indications which are almost infallible. One of these is the number of teats and their position. A sow with fourteen teats, and these commencing well up to the forequarters, and evenly placed on the udder, is almost certain to prove a good milker, as well as being prolific.

Another point noticeable in a good milking sow is the light neck and shoulders which appear to be always found in animals which are good milkers. In fact, the points which are indicative of milking qualities in a brood sow are very similar to those easily distinguishable by a good judge in other varieties of farm stock, whether it be a mare, a cow, or a ewe. There is a something which some persons term a motherly look about an animal of the female sex which should be sought for, and is almost invariably found in one that is prolific and a good suckler.

It would appear to be almost unnecessary to point out that gentleness of disposition is a valuable quality in a breeding sow, and that the want of it frequently results in small litters of wretched and uneven pigs. Some pig-breeders are very anxious that their sows should be of great size. This does not appear to be requisite, as neat, compact, well-formed sows will frequently produce far better litters of pigs than do those extra large ungainly brutes, and, what is of equal importance, they continue breeding for a longer time. These overgrown or extra large sows are generally coarse in the bone, bad on their joints, and of so lethargic a disposition that little notice is taken by them of the cry of a young pig which may by chance be overlaid by its dam, whereas the more active sow is generally most careful with its pigs, and is up in an instant on hearing a cry of distress from any of its youngsters.

Age for Breeding.

There is a considerable difference of opinion as to the age at which yelts should be first mated. Some experienced breeders of pigs view with favour the system of allowing the yelts to be about a year old, as they argue that they will then have arrived at something approaching maturity before the farrowing arrives, when the young sow is at least sixteen months; whereas other equally practical pig-men are in favour of using both boars and yelts by the time they are eight months old. The writer practises this system, because it is considered that fewer yelts prove to be barren if mated when they are young, that they are more prolific and prove to be better sucklers if their first litters arrive on the scene when the young sows are about a year old.

Sometimes it is found a young sow will suckle herself down too much if a large litter of pigs is left on her. This lowness of condition or absence of fat need not necessarily imply weakness, provided care be taken to feed her on nutritious food when the little pigs are about three weeks old, and also to feed the piglings as soon as they will eat, and further, to allow the pigs to remain on the sow for a somewhat longer period than the usual six to eight weeks, according to the time of year.

Another point which is frequently noticeable in at least the second, if not in the subsequent litters, is that those pigs which suck the teats which have been sucked by the first litter of pigs will obtain far more milk than will those pigs which have to be content with the teats which were not drawn upon by the first litter. This affords a strong argument in favour of allowing the yelt to bring up as many as possible of her first litter. Should she appear to be too low in condition, she might be allowed to miss the first period of æstrum; but a better plan is to mate her with the boar, and then give her a little extra food for a few weeks. The improvement in her condition will then be very rapid, if she holds to the boar.

The contention that this early breeding from young sows tends to reduce the size of pigs is perhaps well founded, and may have some force with respect to the smaller breeds of pigs, but appears to be an advantage rather than otherwise with sows of the larger breeds, as these are sometimes found to become too large and cumbersome. Our experience is that the neat, compact, light-boned but lengthy sows, will generally bring up larger and better litters than will sows of extra size; and further, that the produce will prove to be better and more profitable pigs, for all purposes, save perhaps for selling off the sow, when flat-catchers generally realise the most money, and give the least satisfaction to the buyers.

In connection with this point of the weaning of pigs, there appears to be a slight misapprehension on the part of some pig-breeders, who contend that it must be less expensive to keep young pigs off the sow than by allowing them to suck her,—therefore they wean their little pigs at as early an age as five weeks. There is little doubt that this is a mistake, unless, as occasionally may happen, the owner wishes for some special reason to get his sow mated again as early as possible. But even then it is not a certainty that the loss on the pigs does not frequently exceed the gain in the earlier arrival of the next litter of pigs from the sow. Pigs weaned at as early an age as five weeks generally make no progress for two or three weeks; and should the weather prove unfavourable for young pigs, the chances are some of the litter will be permanently stunted.

One of the chief arguments used in favour of this early weaning is that the cost of food is so much greater if shared by the sow. This has been proved to be a mistake. Carefully conducted experiments have conclusively proved that the same quantity of food is required to obtain a given increase of live-weight from pigs when weaned as when these are sucking the sow, even when the pigs are left on the sow for so long a period as ten weeks: what, then, would be the results if the pigs were unfortunately weaned at five weeks old, since it is admitted that pigs as a rule do far better on the sow than when they are weaned before they are eight or ten weeks old? If the question is closely examined, the cause is not far to seek. The sow's digestive organs can not only extract a greater portion of the nourishment contained in rather bulky food than can the more delicate digestive apparatus of the young pigs, but the food, when converted by the sow into milk, is in exactly the form needed by the pigs, and of course more easily digested by them. The little extra cost of keeping the machinery of the sow in motion is more than saved by the work she does in the preparation of the food for her litter. It will also be found that a sow which has had some rest since the arrival of her previous litter, will produce more, stronger, and better developed pigs at the subsequent farrowing than will a sow which is mated within five or six weeks of giving birth to a litter of pigs. So strongly is this held by some pig-breeders abroad that they will allow their sows to farrow but once in a year.

Time for Farrowing.

Unless the owner has very good conveniences for his brood sows, it will be found advisable to try to arrange so that they do not farrow in the last three months of the year. January is quite cold enough generally for little pigs, but youngsters farrowed in that month do reap a great advantage from the lengthening of the days, and from their being about two months old when everything is springing into life and making growth, as do little pigs, particularly in April and May. By timing the first litter to arrive early in the year, the second litter stands so much better a chance, as this will then usually arrive during the long summer days, when the cost of keeping them is slight, and the pigs will become sufficiently old to stand the chills and fogs of November and December. These two months, which in the opinion of many persons should be termed the dead season, from the almost quiescent condition of nature, are usually those in which young pigs make least growth, suffer most from colds and other respiratory complaints, and from such ailments as rheumatism.

There is one other great benefit in having the spring litters dropped as early as possible in the year. By that means the pigs can be fattened off during the summer and sold in August or September, the two months when pork almost invariably sells better than at any other time of the year; and the second litter will go out in February or March, just as the general supply of fat pigs begins to decrease.

Age for Castration and Spaying.

The usual time for operating on the pigs is when they are from six to eight weeks old. It is far better to have all the sow pigs spayed except those intended to be kept for breeding purposes, for not only will the unspayed fat pigs realise a lower price if the fact be discovered, as should they happen to come into use just prior to being killed the meat will not be nearly as firm, and in many instances it will be impossible to cure it, but after the pigs have reached the age of five or six months the unspayed pigs regularly come into heat every three weeks or so, when for three or four days they will eat very little, nor will they rest or allow their mates to rest during this period. The operation of spaying is attended with very little risk, if a competent person is employed and the pigs fed lightly for a day or two before and after the operation. At the actual time of the operation the stomach of the yelt should be empty.

Weaning Pigs.

Even in weaning pigs there is some art. A good plan is to allow the sow to gradually wean the piglings by being turned away from them for a lengthened period each day after the pigs are from six to nine weeks old. The age of the pigs when weaned should vary with the time of year, the age of the sow, and the hardihood and condition of the pigs. The sow will by this means gradually lose her milk, and the pigs will become so accustomed to its cessation that the loss of it will be scarcely noticeable in the appearance of the pigs, provided food of the proper character is supplied to them. In the South the food most generally used for sows suckling and for the young pigs is the coarser kind of "sharps," with a small quantity of broad bran added if the pigs are at all inclined to be feverish and constipated. The bran also tends to increase the flow of milk if fed to the sow.

The newly-weaned pigs will thrive best if fed often on a little food. They are unlike some young animals which are endowed with a large paunch: they require their food often and fairly nutritious. Some of the most successful rearers of little pigs are in the habit of feeding them four or five times per day. Care must be taken not to give the pigs too much food at a time, and then, on the slightest indication of failure of appetite or of a feverish condition of the skin, the quantity and quality of the food should be reduced. It may be well to withdraw all food for twelve or twenty-four hours, give a run for about an hour on a grass field, and supply them with a sod of earth and coal or cinders, and with this the pigs will quite recover from their bilious attack, or from that which would have developed into one had the precautions mentioned, or others, not been taken.

Age for Fattening.

Opinions of equally practical men vary as to whether it is more profitable to allow the growing pigs to live for a few months as stores, and then when they are about seven or eight months old to put them up to fatten, or by feeding the pigs liberally from their youth up to market them as fat when they arrive at the age of seven to eight months. Experiments have been carried on in Denmark, Germany, and the States with a view to furnish proof on this question, and so far as I can discover the early fatting has proved to be by far the most profitable. One of the chief causes for this is that the duration of life in the early fatted pig being less by some three months, there is a saving of food actually required to sustain life and to supply the force required for progression, &c., by the pig, apart from the food necessary for the addition of weight; or to put it in plainer language, at least one-third more food is required to keep up life and motion in the pig fattened late in life than in a pig made fat for the market by the time it arrives say at seven or eight months old.

Another reason for the greater profit arising from the early and continuous fatting of pigs is that the growing pig utilises the whole of the nutritive qualities of the food, whereas the pig which has been kept as a store pig until eight or nine months old mainly extracts from the food eaten by it those constituents which add flesh, the remaining constituents passing through the pig unutilised and wasted. In the United States a considerable number of experiments have been carried out. These are summarised in the following table:—

Average weight of pigs in lbs.	Average food eaten per day in lbs.	Food: eaten per 100 lb. live-weight in lbs.	Average gain per day.	Food for 100 lb. gain.
38	2·23	5·95	·76	293
78	3·35	4·32	·83	400
128	4·79	3·75	1·10	437
174	5·91	3·43	1·24	482
226	6·57	2·91	1·33	498
271	7·40	2·74	1·46	511
320	7·50	2·35	1·40	335

These are the results of as many as 464 carefully conducted trials, so that they may be accepted with every confidence, although they are not in accordance with the general belief of pig-feeders of olden, if not of recent or even present, times. It was generally believed that a fat pig made a far better return from the food it consumed when it approached the ripening period than did a young pig or one when first put up to fatten. Experiments carried on in Denmark gave very similar results. In the reports of these trials a table is given showing the average amount of food required by pigs of varying ages to make a gain of 100 lb., and from this table it is seen that the quantity of food required gradually increases with the age of the pig.

Food required for Upkeep of Body.

So far as I can learn, there have not been many experiments carried on to prove just how large a proportion of the food consumed by the pig is actually employed in the upkeep or support of the pig. The only way of arriving at this knowledge would be by so feeding the pigs that the live-weight should continue as nearly as possible the same. Such an experiment is reported from the States, in which pigs of various ages were employed, and the food used "middlings"—this, I believe, meaning wheat middlings. The average results from four lots of pigs, two of which were experimented on in summer and two of them in winter, proved that as nearly as possible 2 lb. of middlings per 100 lb. of live-weight of pig was daily required to sustain life; or in other words, that a pig weighing 100 lb. alive will consume each day 2 lb. of middlings without any return, so that if the proportion be the same for a 300-lb. pig as for one weighing 100 lb., the former would have to be supplied with 6 lb. of middlings per day beyond any food which the pig would consume and convert into pork.

This throws a strong light on the question of early and late fattening of pigs. Thus a store pig weighing 100 lb. would require a stone of 14 lb. of middlings each week simply to keep its machinery at work, then if this were continued for twelve weeks, we should have a consumption of 1½ cwt. of food from which no return in meat would be gained, or an unnecessary outlay of some 9s. This would frequently determine the question of loss or profit in the fatting of a pig, as it would be about 10 per cent of the usual sum received for a fat pig.

Advantage of Mixed Foods.

Another point which is not always sufficiently studied is the desirability of feeding to pigs of all ages a mixture of foods. The fact that for young pigs the best single food is "middlings," and for fatting pigs barley-meal, appears to be so generally known that the belief exists that no combination of foods is more profitable. It may not, perhaps, be a very delicate way of putting it, but it is nevertheless a fact that a variety of food is equally as beneficial to a pig as to a human being.

This question of an admixture of food is of perhaps most importance to those pig-keepers who have at their disposal dairy offal. As we all know, skim-milk is a valuable food for both young and fatting pigs, therefore, it is argued by some pig-men, that it is not possible to give pigs too much skim-milk. This is said to be an error, and it has undoubtedly been proved that a far greater return can be obtained from a comparatively small quantity of skim-milk when mixed with other foods than if fed alone, or even if it forms the major portion of the pig's food. This limited amount of benefit derived from large quantities of skim-milk fed to pigs has led some of our theoretical experts to express an opinion that the value of skim-milk for pig-keeping is greatly overvalued, and that instead of its being worth at least 1½d. per gallon, its value is nearer half that sum as a pig food. How great the difference in the value of separated milk in pig-feeding may be made, by using it skilfully or the reverse, is clearly shown in a series of experiments carried on in the States by Professor W. A. Henry, to whom stock-raisers in all parts of the world are very greatly indebted.

It was clearly proved that separated skim-milk, in varying proportions of from 1 to 3 lb. to 1 lb. of corn-meal, was of nearly twice the value of the separated milk when mixed with one-eighth of its weight of corn-meal; or, in other words, that by using an undue proportion of milk to corn you reduced the feeding value of the separated milk by one-half. In this way only can be explained the great divergence in the views of different persons as to the feeding value of separated milk.

It is also claimed, and we believe justly so, that separated and skim milk is of far more value for feeding to young than to old pigs. There is little doubt that its chief value is as an adjunct, rather than as a sole food. It is often said that the separated milk is of far less value for pig-feeding than the skim-milk of olden days. This appears to be an exaggerated view. The skim-milk certainly gave a slightly better return than the separated milk, but this appeared to be due to the greater quantity of butter-fat left in the skim-milk. This was not a gain, since butter-fat is too expensive a food on which to feed pigs, especially if the fat is needed to render the separated milk easily digested. Fat of other and cheaper kinds could easily be added.

Importance of Comfort.

In some parts of the country sufficient attention is not paid to the housing of fat pigs, especially in very cold weather. So great is the variation in the results of feeding a bushel of maize under different conditions as to be almost impossible of belief. It has been proved that, under favourable conditions as to temperature and surroundings, as much as 13 lb. of live-weight increase has been made by well-bred pigs by the consumption of one bushel of maize; and that equally as good pigs have failed to make any increase when exposed to severe cold—the whole of the sustenance contained in the food being employed in supplying the bodily wants of the pig. In this country we are fortunately not subject to this intense cold, but much of the feeding value of the food given to fatting pigs is lost in very cold weather, simply by giving the food to the pigs in a half-frozen state; whereas by the addition of a small quantity of boiling water the food would be in a fit state for the digestive organs of the pig to commence work at once, instead of having to wait until a considerable proportion of the heat of the body has been wasted in bringing up the food to the proper heat.

It is in these apparently trivial matters that pig-breeders so frequently err; and then when the balance-sheet is on the wrong side, nothing is so easy and natural as to declare that pigs are unprofitable brutes, or profitable only to Americans or others living on lands where pig-food costs next to nothing, and, it might be added, where pork realises a proportionate price. It is an undoubted fact that unprofitable pigs are most frequently the outcome of want of knowledge, either in selecting the right kind, or in feeding on suitable food in the best manner.

In years gone by, when it was the fashion to fatten pigs to heavy weights, it was no uncommon thing for the fatting pigs to be kept shut up and fed for months on one particular kind of food, generally barley-meal, without the slightest variation or addition to their usual food. Can one be surprised to learn that the return from each stone of barley-meal was but a miserably small one? If our forebears had only given the pigs an opportunity to find a change for themselves by letting them out for a run each day for a few minutes, the progress would have been faster, and the meat of a far better quality.

For experiments proving this statement we have, of course, to go abroad. For some years the increase in live-weight was recorded of various lots of pigs, one portion of which were confined in pens and the other portion allowed exercise on a pasture. Note was taken of the amount of corn consumed by each lot, the daily increase, and the return made for each bushel of food consumed. The results were marvellously in favour of the various lots of pigs which were allowed to have exercise.

An occasional run for a few minutes is certain to prove of benefit to pigs which are confined in pens for fatting purposes. If this exercise is an impossibility, then by all means see that the pigs have every few days some small coal or cinders. Even a shovelful of earth will tend to keep them in health, and add greatly to their thrift. In the States, where Indian corn is the chief pig-food, the cobs of the maize are converted into charcoal and placed within reach of the pigs. Wood-ashes are also frequently fed to the pigs. With a mixed food, these additions may not be so necessary, but good results will be found to follow the giving of a little dessert in the form of coal, &c., to the fatting as well as to the young pigs.

Disposal of Pigs.

It was suggested that the disposal of the store and fat pigs should also be touched upon. As to the former—the selling of store pigs—we would repeat 'Punch's' advice to those about to enter the matrimonial state—"Don't." In almost all cases it is more profitable to breed the very best pigs and to fatten them in the quickest way on a variety of food. Whatever profit there may be in the various operations will then remain with the person to whom it most belongs, the intelligent owner and feeder of the pigs. With this system disappear the risk of disease, waste and expense in transit, and the dealer's outlays and profits, all of which are not slight.

Then as to the best manner of disposing of the fattened pigs. This will vary considerably, but in most cases it will be possible to sell them to some bacon-curer, butcher, or provisioner, either by live or dead weight, so long as the pigs are of the correct size, substance, and degree of fatness, and fattened on the proper kind of food. It will be found that buyers of fat pigs will readily take a regular supply of the very best fat pigs, and only such can be produced at a good profit over any length of time. Our foreign competitors can furnish us with any quantity of inferior pork, which must be sold at some price or other on its arrival on our markets. It would be folly for us to enter into competition with them, as we are certain to be beaten, whereas in the manufacture of the best quality of pork products no country in the world can beat us.

INSECT ATTACKS IN 1898.

By R. S. MacDougall, M.A., D.Sc., Consulting Entomologist
to the Society.

During the past year the communications from members as to insect attack have not been numerous. They have related for the most part to injury done to fruit and fruit-trees, and to forest trees in all stages of growth.

The worst damage was done to black currant by *Phytoptus ribis*, to the pear by *Diplosis pyrivora*, and to a plantation of pines by *Lophyrus rufus* and *L. pini*.

Before dealing with these in detail, I may say that specimens of apple leaves were sent from Fife in July. These leaves contained each several larvæ of one of the small mining-moths concerning whose work, as far as I know, no complaints have hitherto been made in our country.

Caterpillars were also sent from another district, where they were defoliating young ash plants. The caterpillar on examination proved to be that of the Privet Hawk Moth (*Sphinx ligustri*), easy to recognise from its great size and the characteristic horn on the upper surface at the tail-end.

Other insects sent as doing harm to the ash were *Hylesinus fraxini*, the Ash-bark Beetle, and *H. crenatus*, the Black Ash-bark Beetle. Both of these insects make their galleries between the bark and the wood. As the work of the two beetles is not always distinguished the one from the other, I point out in parallel columns how the two can be differentiated both as insect and in work.

Hylesinus fraxini.	*Hylesinus crenatus.*
Light-brown, or it may be darker; thickly beset on under surface with grey hairs.	Black, with few hairs.
Smaller. 2½ to slightly over 3 millimetres.	Larger. 4½ to 5½ millimetres.
Mother-gallery 2-armed, the arms being about equal in length and running in the transverse direction.	Mother-gallery 2-armed, running in transverse direction, but one arm often longer than the other.
Larval galleries shorter, and running longitudinally—*i.e.*, at right angles to the mother-gallery.	Larval tunnels much longer than in *fraxini*, and longitudinal in direction to begin with, but soon it may be bending round to run parallel with the mother-tunnel.

From East Lothian complaint came regarding green-fly on plum; and "clegs" taken on horses, and galls from the lime-tree from Peebles.

THE BLACK CURRANT GALL-MITE (*Phytoptus ribis*).

Towards the end of January of last year several shoots of the black currant were sent to me from Fifeshire, with a complaint that these were some of a large number which were similarly attacked. On examining the twigs the buds were found to be swollen, and a dissection of these with following examination under the microscope revealed many mites, whose feeding on the enclosed part of the buds had caused the swelling.

The pest was, as named above, *Phytoptus ribis*, which unfortunately has of late years been the cause of much loss to growers of black currant. The mite is also spreading.

The Phytoptidæ form a section of the large family of Mites, a family which includes the Harvest Mite and the Hay Mites, the Red-spider or Spinning Mite, and the Mange or Scab Mites; but the Phytoptidæ have an elongated body with only four legs, while the others have somewhat rounded or oval bodies, and six or, in the adult state, eight legs.

The Phytoptidæ cause galls or excrescences on the leaves of many trees—*e.g.*, pear, plum, maple, willow, lime—or else they live in buds, which swell in consequence.

The Black Currant Gall-Mite is a very minute form, requiring the microscope for its examination. Magnified, it shows an elongated transversely striated body, with four legs terminated by a claw and bristles. Projecting from the front half of the body are two pairs of bristles, another pair near the tail-end, and two long bristles at the tail.

By means of a proboscis the mites nourish themselves on the sap of the buds. The mites, which pair and lay eggs from February onwards till the autumn, remain in the attacked buds (all stages being met with from egg to adult) till these shrivel or in some other way become no longer habitable.

Then there is a migration to the neighbourhood of the next year's buds, and these seem to become infested or tenanted in late summer, for mites have been found in the next year's buds in the autumn.

Preventive and Remedial Measures.—Do not plant any black currants that show traces of infestation, nor (at the end of the season) use cuttings from infested plants.

As a remedial measure, keep a careful outlook for the first signs of damage, with a removal and destruction of all swollen buds.

It has been recommended that on the fall of the leaves these should be dug in, a dressing of hot lime having first been given. This would ensure the death of any mites present on the leaves. At the same time a severe pruning or cutting back may be practised, followed by a spraying with paraffin emulsion; this spraying to be repeated in the spring-time. There are various formulas for paraffin emulsion, one of which may be quoted:—

Hard soap	½ lb.
Soft water	1 gallon.
Paraffin	2 gallons.

Add the warmed paraffin to the soap dissolved in the boiling water, and churn thoroughly. This can be diluted to any strength with water.

Where attack is limited to a few bushes, do not attempt to cure, but uproot and destroy. Where infestation is widespread nothing will save the crop, which had better be destroyed, and some other crop planted for a time. I know cases where this has had to be done, after much persevering work directed towards remedy.

THE PEAR-MIDGE (*Diplosis pyrivora*).

This insect, the *Cecidomyia nigra* of Meigen, appears also unfortunately to be spreading in our country. In the month of June I received from an orchard some pears attacked by a pest which had (as the letter said) "destroyed the greater part of the crop in the gardens." On dissecting the pears, which were about the size of marbles and withered-looking and rotten, I found many larvæ of the pear-midge.

The life-history is as follows: The adult midges issue from their cocoons in the soil early in the year—from, in some cases, the end of January on to April, and even later. The females lay their white eggs in little masses inside the blossom of the pear, usually before the flower expands, the blossom being pierced for the purpose by means of the ovipositor. Schmidberger thus describes the process of egg-laying: "I found the first gall-midge in the act of laying its eggs in the blossom; this was on the 12th of April. It had fixed itself almost perpendicularly in the middle of a single blossom, and having pierced the petal with its long ovipositor, it laid its eggs on the anther of the still closed blossom. The eggs are whitish, longish, transparent, and from ten to twelve in number."

The eggs quickly give up their maggots, which proceed to feed on the pear. The number of maggots inside each attacked pear varies. In twelve pears picked at random from the infested material, the numbers were 16, 21, 28, 5, 9, 15, 19, 15, 17, 23, 16, 10. In the case of the smaller numbers some of the maggots had already left the pears. As a result of the feeding of the maggots, the pears grow no bigger than marbles, and their interior is discoloured and rotten. The shrivelled, misshapen character is a guide to the attack. The full-fed larvæ leave the pears while these still remain on the tree, or they fall to the ground with the pears, which they leave later. From a second supply of pears received at the end of June the maggots were leaving in hundreds, and very interesting it was to see them skipping about as they lay on my table. This active movement is characteristic of certain species of Cecidomyidæ, and may be well seen also in the case of the maggots of *Cecidomyia tiliæ,* which are found inside the galls common on twigs and flowers of lime.

Having left the pears, the larvæ enter the soil, where they are supposed to lie for some considerable time before pupation, which takes place in a thin cocoon. The adults appear in the next spring.

Description of Midge.—One-tenth of an inch long, and blackish in colour. The antennæ are brown-coloured and very long. The legs are also long. The females, besides having longer antennæ than the males, have a conspicuous ovipositor.

The larvæ are legless and have fourteen segments. They are yellowish in colour, and have on their under surface at the head-end the brownish so-called "breastbone" or "anchor-process," thought by some to aid the maggot in progression, and by others to be of use in feeding.

Remedial Measures.—This pest can cause great losses. In the letter acquainting me with the attack it was mentioned that seldom was a full crop of pears got because of the pest. There is this to encourage growers, however, that where proceeded against vigorously success may follow. Such a case is reported by Professor J. B. Smith of New Jersey, who in a report in 1894 mentions severe attacks, but writes in the 1897 report, which he was kind enough to send to me, that in the previous badly attacked localities the pest seems to have been stamped out Dr Smith, as a result of his experiments, recommends treating "the ground below the trees with a heavy top-dressing of kainit, one ton to the acre, applied between the middle and end of June." This, applied immediately after rain and before the maggots have made their cocoons, will cause their death. The same authority recommends ploughing the infested ground, say, in July, so that the maggots which escape crushing will be buried too deeply for the future midge to make its way aboveground. Where circumstances render this measure impracticable, the principle of burying the grubs should not be lost sight of. The pear-midge can only be satisfactorily combated when as larva or pupa in the ground. Picking up and picking off the infested fruit would be an extremely useful measure. The attacked pears can be known by their withered, discoloured, and cracked appearance.

THE PINE SAWFLY (*Lophyrus pini*) AND THE FOX PINE SAWFLY (*L. rufus*).

In the course of the summer there was sent from the North a number of caterpillars for determination and advice. The caterpillars were from a 700-acre plantation on the west coast of Ross-shire, where for two years in succession they had done very much damage to the Scots fir by eating the leaves. The pests on examination proved to be the larvæ of *Lophyrus rufus*, the Fox Pine Sawfly. I continued to feed the larvæ in confinement, and in the month of August bred out the sawflies from the cocoons the caterpillars had made.

Later on I received from the same place another supply of caterpillars, these being the larvæ of *Lophyrus pini*. These sawflies are hymenopterous insects, whose females lay their eggs in holes sawed in leaves by means of the ovipositor. The caterpillars are active forms with a large number of legs. *L. pini* may be taken as an example. From the eggs laid by the females early in the summer caterpillars hatch. These have brown or black shining heads, dirty-green bodies, with black dots on the segments, and twenty-two feet. The larvæ are social forms, feeding in companies or clumps, and capable of doing much damage by eating the needles of the pine, and also gnawing the bark of the shoots. The young caterpillars eat the needles from the edges, leaving the midrib; the older caterpillars eat the entire needle save a little stump at the base. As the larvæ grow (they measure an inch when full grown) they moult several times, their moulted skins being found sticking to the twigs. When full grown they make an oval brownish-yellow tough cocoon in the soil, or sometimes attached to the twigs or needles. From this cocoon, which opens by a circular lid, the sawfly issues in a longer or shorter time, according to the season. In favourable weather conditions there may be two broods in the year. The life-cycle of the first brood may be said to last for three months, two of these (May and June) being passed in the caterpillar stage. The second brood of flies appears in August and September, and the larvæ from these pass the winter in their cocoons.

As to the adult sawflies, the males are black, legs light-coloured, antennæ combed, wings four, transparent. The female is yellowish with black head, and black spots on thorax and abdomen; antennæ toothed.

Lophyrus rufus: Male glossy black but first abdominal ring, and the feet, except the claws, red. Female larger and body reddish yellow. The larva has a black head and a greenish-grey body with longitudinal stripes. The cocoon is lighter in colour and not so tough as that of *pini.*

Remedial Measures.—Shake the caterpillars down from the trees, collect, and destroy; or squeeze and kill them by means of the gloved hand or a pair of scissors made for the purpose with flat wooden tongues; or syringe the plants with a solution of hellebore—1 oz. to 2 gallons of water—or Paris green—1 oz. to 15 gallons of water (it must not be forgotten that hellebore and Paris green are poisons, and that Paris green especially must be handled with great caution).

The soil at the foot of the trees may be also turned up and the exposed cocoons crushed. The cocoons, however, are not always easy to find.

Insectivorous birds should be encouraged. The caterpillars are not very hardy, and are kept in check by unfavourable weather.

In concluding this report, I would remind members of the Society that I shall be glad to advise them regarding insects or allied animals which in any stage of their development infest—

(*a*) Farm crops.
(*b*) Stored grain.
(*c*) Garden and greenhouse plants.
(*d*) Fruit and fruit-trees.
(*e*) Forest trees and stored timber.
(*f*) Live stock (including poultry).

Members making complaint of injury will please forward with their queries examples of the injured plants or parts of plants, as specimens are always better than descriptions. Specimens of the insects or other animals believed to be the cause of the injury should also be sent. To prevent injury in transmission, all specimens should be sent (to 3 Mertoun Place, Edinburgh) in tin or wooden boxes.

THE CEREAL AND OTHER CROPS OF SCOTLAND FOR 1898, AND METEOROLOGY OF THE YEAR RELATIVE THERETO.

THE CROPS.

THE following comparison of the cereal and other crops of 1898 with those of the previous year has been prepared by the Secretary of the Society from answers to queries sent to leading agriculturists in different parts of the country.

The meteorology of the year has been furnished by Dr Alex. Buchan, Secretary of the Meteorological Society of Scotland.

The queries issued by the Secretary were in the following terms:—

1. What was the quantity, per imperial acre, and quality of grain and straw, as compared with last year, of the following crops? The quantity of each crop to be stated in bushels. What quantity of seed is generally sown per acre?—(1) Wheat, (2) Barley, (3) Oats.
2. Did the harvest begin at the usual time, or did it begin before or after the usual time? and if so, how long?
3. What was the quantity, per imperial acre, and quality of the hay crop, as compared with last year, both as regards ryegrass and clover respectively? The quantity to be stated in tons and cwts.
4. Was the meadow-hay crop more or less productive than last year?
5. What was the yield of the potato crop, per imperial acre, as compared with last year? The quantity to be stated in tons and cwts. Was there any disease? and if so, to what extent, and when did it commence? Were any new varieties planted, and with what result?
6. What was the weight of the turnip crop, per imperial acre, and the quality, as compared with last year? The weight of the turnip crop to be stated in tons and cwts. How did the crop braird? Was more than one sowing required? and why?

7. Were the crops injured by insects? State the kinds of insects. Was the damage greater or less than usual?
8. Were the crops injured by weeds? State the kinds of weeds. Was the damage greater or less than usual?
9. Were the pastures during the season of average growth and quality with last year?
10. How did stock thrive on them?
11. Have cattle and sheep been free from disease?
12. What was the quality of the clip of wool, and was it over or under the average?

From the answers received, the following notes and statistics have been compiled:—

EDINBURGHSHIRE. *Wheat.*—About 48 bushels; quality about the same as last year; straw about the same; 3 bushels seed sown.

Barley.—About 56 bushels; quality about the same as last year; straw a bulky crop; 3 bushels seed sown.

Oats.—About 52 bushels; quality fine; straw much the same as last year; 4 bushels seed sown.

Harvest commenced about 24th August, a week earlier than last year Very good weather.

Hay.—First crop heavier than last year; about 3 tons. Second crop light; about 1 ton. Both crops well secured. *Meadow-hay*—About the same as last year; well secured.

Potatoes.—Double the crop of last year; average about 8 tons. Some new varieties planted with very good results.

Turnips.—A light crop; about 20 to 25 tons. Both yellows and swedes. Very little second sowing. *Mangel-wurzel*—A better crop than last year.

No damage from insects or weeds.

Live Stock.—Pastures very good, much the same as last year. Stock healthy and did well; quite free from disease. Sheep and cattle throve well on the pastures *Clip of wool*—About the average; very low prices.

LINLITHGOWSHIRE. *Wheat.*—About the same in quantity and quality as compared with last year; from 30 to 40 bushels; seed from 2½ to 3 bushels.

Barley.—Better in quantity and quality than last year; from 30 to 40 bushels; seed from 2½ to 3 bushels.

Oats.—Better in quantity and quality than last year; from 30 to 40 bushels; seed from 4 to 5 bushels.

Harvest began and ended about the usual time.

Hay.—About the same as last year; from 1½ to 3 tons. *Meadow-hay*—Very little grown.

Potatoes.—Better in quantity and quality than last year; from 5 to 8 tons.

Turnips.—Very variably; not so good as last year; great complaint of finger-and-toe. Some second sowing, and in some cases did not braird well.

No injury by insects or weeds.

Live Stock.—Pastures of average growth and quality. Stock throve fairly well. Cattle and sheep free from disease. *Clip of wool*—Average.

HADDINGTONSHIRE (Upper District). *Wheat.*—None grown.

Barley.—40 to 42 bushels; quality of grain and straw better than last year; 3 bushels of seed sown.

Oats.—42 to 44 bushels; quality of grain and straw better than last year; 4 bushels of seed sown.

Harvest began at usual time.

Hay.—2½ tons; better quality than last year. *Meadow-hay*—More productive than last year.

Potatoes.—5½ to 6 tons; no disease. No new varieties planted.

Turnips.—19 to 20 tons; crop brairded well; only one sowing required. On gravelly land mildew very prevalent.

No injury by insects or weeds.

Live Stock.—Growth and quality of pastures better than last year. Stock throve very well. Cattle and sheep free from disease. *Clip of wool*—Average.

HADDINGTONSHIRE (Lower District). *Wheat.*—52 bushels; very big crop of straw; a half more than last year; 3½ bushels sown.

Barley.—56 bushels; quite as much straw as last year; 2¾ bushels sown.

Oats.—48 bushels; not so much straw; 4 bushels sown.

Harvest began about 17th August, or three days earlier than last year.

Hay.—2 tons, or about the same as last year, of first crop; no second crop on account of the dry weather. *Meadow-hay*—None grown.

Potatoes.—6 to 8 tons, or about 2 tons more than last year; a little disease among the earlier varieties.

Turnips.—10 to 15 tons, or just half the crop of last year; middling quality; not much second sowing; mildewed very early.

No damage by insects or weeds.

Live Stock.—Pastures very bare all summer owing to dry weather. Stock did fairly well, and were free from disease. *Clip of wool*—Average.

BERWICKSHIRE. *Wheat.*—38 bushels. Crop was much benefited by the warm dry summer weather. Seed, 3 and 3½ bushels, depending on time of year and condition of soil.

Barley.—40 bushels. Same remark as to wheat.

Oats.—36 bushels. The warm dry weather was against the oat crop, unless in exceptionally fine land. 4 bushels used as seed.

Harvest began at the usual time, about 24th August.

Hay.—25 cwt. Suffered from the drought. *Meadow-hay*—Crop less than last year by 5 cwt., owing to the drier season.

Potatoes.—Last year there was only half a crop, 4 tons; this year there will be nearly, if not, 8 tons.

Turnips.—15 tons; smaller by 10 tons than last year. Quality very inferior, especially the yellow- and white-fleshed turnips, owing to the drought, which caused severe mildew, and rendered the flesh of these turnips dry and corklike. Swedes, although severely affected, recovered somewhat when rain came in autumn.

No injury by insects. Wherever "yellow weed" (*Sinapis arvensis*) and "runches" (wild radish or *Raphanus raphanistrum*) seed was present these weeds bloomed very plentifully; and your reporter is glad to observe that an application of 7½ per cent solution of sulphate of iron or copper in 40 gallons of water per acre has been found in Durham to destroy the young seedlings when 2 inches high, and *not injure the young corn* owing to the smooth stems.

Live Stock.—Pastures under average owing to drought. Stock throve well. Cattle and sheep free from disease. *Clip of wool*—Average.

ROXBURGHSHIRE. *Wheat.*—About 28 bushels; quality better, with a little less straw than last crop.

Barley.—About 39 bushels; of better quality, with more and better quality of straw than last crop.

Oats.—About 30 bushels; better quality, but short of both straw and grain from last crop.

Harvest about a week earlier than an average.

Hay.—About 1½ ton; quality fine. *Meadow-hay*—Scarcely so heavy as last year, but very well got.

Potatoes.—About 6 tons marketable; considerably better crop than last, and fine quality.

Turnips.—Very little second sowing; about 14 tons; at least a third smaller a crop than last; brairded well, with the exception of some late-sown fields.

Little or no damage by insects. A good deal of wild mustard or skellock.

Live Stock.—Pastures a good deal dried up in July and August, but quality good. Stock did well, considering the dry season. Cattle and sheep very healthy. *Clip of wool*—About average.

SELKIRKSHIRE. *Wheat.*—None grown.

Barley.—36 bushels; quality better; straw very short; seed nearly 4 bushels.

Oats.—36 bushels; quality very good; straw very short.

Harvest began about eight days before the usual time.

Hay.—About 50 cwt.; quality excellent. *Meadow-hay*—Better; quality could not be excelled.

Potatoes.—Better; 8 tons 10 cwt.; no disease. Just about the usual varieties.

Turnips.—Very irregular owing to mildew; an average might be 14 tons over the county; brairded well; one sowing.

No injury by insects or weeds.

Live Stock.—Pastures under average; quality good. Stock did well, and were free from disease. *Clip of wool*—Good, and over average weight.

PEEBLESSHIRE. *Oats.*—30 bushels; 1 ton straw. Grain and straw more abundant than last year; 5 bushels seed sown.

Harvest began at the usual time.

Hay.—Ryegrass 30 cwt.; clover scarce. *Meadow-hay*—Average crop

Potatoes.—8 tons 10 cwt.; almost no disease; no new varieties planted.

Turnips.—24 tons; crop brairded well; only one sowing required.

No injury by insects or weeds.

Live Stock.—Pastures were of average growth. Stock throve well. Cattle and sheep free from disease. *Clip of wool*—Quality good; quantity average.

DUMFRIESSHIRE (Annandale). *Wheat.*—None grown.

Barley.—Very little grown.

Oats.—Quantity of straw 5 cwt. less than last year; quantity of oats more (4 bushels). Quality of straw better; quality of oats worse, owing to discoloration in stook from wet weather. Quantity of seed sown 3 to 4 bushels if drilled, 5 to 6 if sown broadcast.

Harvest began about 20th August, or ten days earlier than usual.

Hay.—Quantity 1¼ ton, about 5 cwt. less than last season—this loss chiefly owing to a deficiency in clover. Quality good, owing to extra good weather for hay-making. *Meadow-hay*—Meadows would produce about the same quantity as last year.

Potatoes would yield about 10 or 11 tons, as compared with 6 or 7 tons last year. No disease, and no new varieties grown.

Turnips.—Quantities about 25 tons in 1897 and 18 tons in 1898; quality distinctly inferior, owing to a short growing season, and to the crop being lifted before being properly matured. Crops brairded badly, especially first sowing; this was chiefly owing to land being wrought during a spell of wet weather in May; afterwards a long period of dry weather set in. Plants came slowly, and were eaten by the fly as they came. Resowing had to be resorted to on most farms. In not a few cases turnips were sown three times.

As stated above, the damage by the turnip-fly was much greater than usual. No other insect complained of. Amongst the cereal crops "runch" was the only weed complained of. On land where this weed grows the damage done is stated as worse than for a number of previous years. Weeds in green crops were easily kept under owing to dry summer.

Live Stock.—Pastures—Growth an average; quality better. Stock throve well. Cattle have been free from disease. Some farmers complain of bad foot-rot in sheep. Quality of *wool* was good; weight would compare favourably with last year.

DUMFRIESSHIRE (Nithsdale). *Wheat.*—Not grown.

Barley.—Not grown.

Oats.—28 bushels of good quality grain; average quantity straw, of excellent quality; seed, 5 bushels.

Harvest early, about 12th August; finished about middle September.

Hay.—Ryegrass good crop, 30 cwt.; little clover in hay or aftermath. *Meadow-hay*—Over an average—better than previous year; well secured.

Potatoes.—8 tons; early varieties much diseased, but later varieties sound. Several new varieties tried.

Turnips.—Short of last year; about 18 tons; not standing much eating. Where early sown brairded well, and no resowing necessary; after Whitsunday brairded badly, and in some cases never were a crop.

Wireworm seen in oats and turnips, and crows troublesome in latter crop. Little damage from weeds, the thistles becoming too prevalent in many oat-fields.

Live Stock.—Pastures very bare until autumn growth, when growth of grass was phenomenal. Stock throve well, unless where overstocked in early summer. District free from disease unless in autumn, when sheep very lame, to be attributed to luxuriance of the pastures. *Clip of wool*—Average clip as to quality and quantity; price lowest of the century.

DUMFRIESSHIRE (Eskdale). *Wheat.*—None grown in this district.

Barley.—Scarcely any grown.

Oats were light in straw owing to frosty nights after brairding and continued dry weather up to the middle of June, when rain came, effecting a great improvement; but straw never recovered, being very short, consequently light to the extent of one-third in weight, or, say, 15 cwt. straw; while yield of grain was good, both in quality and quantity. About 40 imperial bushels; 5 imperial bushels sown. Well got, grain well filled, and so dry and hard, almost equal to old oats.

Harvest quite ten days earlier than average seasons.

Hay.—Ryegrass very good and well got; would average about 32 cwt. *Meadow-hay*—Heavy crops as a rule, especially where not early cut, having grown amazingly after the middle of July. Many meadows would yield about 35 cwt., average probably 30 cwt., and all got in first-rate condition.

Potatoes.—Nearly double the crop of last year, approaching 8 tons. Some varieties developed disease in September, but not to any great extent. Up-to-Date clear of any disease. All varieties were of splendid quality, and harvested in beautiful order, owing to the very dry weather then prevailing.

Turnips.—Much better than last year; weight about 22 tons, although quality is somewhat deficient, with a good many unsound turnips amongst them, but fairly clear of finger-and-toe. Crop brairded very well indeed, and sowing over again rare.

No injury to complain of by insects. Weeds not so luxuriant as usual, and owing to fine dry weather were nicely wrought and easily overcome. Mustard or runches, as they are generally termed, are the prevalent weeds.

Live Stock.—Pastures suffered from drought during May and June; but no great damage inflicted, a great rush of grass coming after the rain. Stock throve well all summer, and as a rule healthy; braxy as usual being prevalent amongst hill stocks on farms subject to this disease. Many cows are barren from causes unknown, service coming very irregular amongst them. Part no doubt aborted, which accounts for this irregularity, but not altogether. Stock very free from disease, except, as stated, upon unhealthy farms—hoggs upon which suffer more or less every year. *Clip of wool*—Not quite an average either in weight or quality, probably owing to the extremely open winter and heavy rainfall in early spring.

STEWARTRY OF KIRKCUDBRIGHT. *Wheat.*—32 bushels; seed, 2½ to 3 bushels; straw, average.

Barley.—36 bushels; seed, 3½ to 4 bushels; straw, average.

Oats.—38 bushels; seed, 4½ to 5 bushels; straw, average. Quality of oats and straw better than last year.

Harvest a week earlier than usual.

Hay.—Yield 25 to 35 cwt.; quality very good. *Meadow-hay*—Rather better than last year.

Potatoes.—6 to 8 tons; fully an average, and much better than last year; quality good; little disease.

Turnips.—About 18 tons; braird irregular, some fields blanky; some resowing.

Wireworm—worse than usual. No injury by weeds.

Live Stock.—Pastures better than last year, especially in autumn. Stock throve well, and were free from disease. *Clip of wool*—Quality and quantity average.

WIGTOWNSHIRE. *Wheat.*—31 bushels. Grain and straw much more productive—say 10 per cent over last year—owing to warmer summer, and season more suitable for growth of crop and straw; say weight of straw, 30 cwt. Seed sown, 2¼ to 3¼ bushels, according to the time of year and state of land when sown.

Barley.—34½ bushels. Grain and straw more productive than last year, owing to more heat and sunshine, which improved the quality of the grain. Increase of grain 6 or 7 per cent. Straw, say 17¼ cwt. Seed sown, 3 to 3½ bushels.

Oats.—35 bushels. Grain and straw both about 6 per cent more than last year, owing to the season being more suitable; weight of straw 16 cwt. Seed sown, 5 bushels.

Harvest about ten days later than former years.

Hay.—35 cwt., being about 5 per cent more than last year. Clover or after-growth very poor, from want of rain. Quality of hay very good, owing to being made in good weather. *Meadow-hay*—21 cwt., about 3 per cent more than last year; quality good.

Potatoes.—5 tons, fully more than double that of last year; disease same as former years; extra crop, owing to warmer season and more suitable for potato-growing. No new varieties tried.

Turnips.—16½ tons; quality same as last year; quantity about 1¼ ton more than last year; braird not so good as last year; rather more resowing, owing to frosty mornings when brairding.

No injury by insects. No damage by weeds.

Live Stock.—Pastures average growth and quality, excepting in July, during which there was little or no growth, especially on warm dry land, for want of rain. Stock throve very well. Cattle and sheep free from disease. *Clip of wool*—Average.

AYRSHIRE. *Wheat.*—40 bushels; fine quality grain and straw; crop above average; seed, 3 bushels.

Barley.—38 bushels; fair quality; about average; seed, 3 bushels.

Oats.—42 bushels; fair quality, similar to last year; seed, 4 bushels white, 6 bushels black.

Harvest began about usual time, 15th to 20th August.

Hay.—Light crop; secured in good order; 32 cwt. Great want of clover and aftermath; poor on this account. *Meadow-hay*—Less productive.

Potatoes.—The early crop was the heaviest lifted for many years, ranging from 6 to 12 tons, according to situation and time of raising. Disease began to show towards the end of July, but caused much less damage than usual.

Turnips.—Fair average crop; 22 tons. Finger-and-toe has been much more prevalent this season than usual. The crop brairded well, and little resowing was necessary. Great damage was done to many fields by crows pulling the young plants, which would indicate the presence of insects; but excepting this, no damage was directly done to the crop by insects.

No damage by weeds where due care was exercised in keeping the weeds in subjection.

Live Stock.—Pastures quite average. Stock throve fairly well. Cattle and sheep free from disease. *Clip of wool*—Quality and quantity about average.

BUTE. *Wheat.*—40 bushels; fair quality; straw bulky; 3½ bushels of seed sown.

Barley.—3½ bushels sown; grain, 38 bushels; well got; straw bulky.

Oats.—5 bushels sown; 36 bushels grain; well got; straw above the average.

Harvest began on 15th August, earlier than usual.

Hay.—2½ tons; above the average; well got. *Meadow-hay*—Little in Bute.

Potatoes.—7 tons on the average of early and late potatoes; no disease; usual varieties. Early potatoes commenced to be lifted 15th June.

Turnips.—From 15 to 20 tons; about 10 tons under average; finger-and-toe prevalent; too "rooty"; weather too dry beginning of August; crop brairded well; no resowing.

No injury by insects or weeds.

Live stock.—Pastures above average. Stock throve well. Cattle and sheep free from disease. *Clip of wool*—Average.

ARRAN. *Wheat.*—None grown.

Barley.—None grown.

Oats.—Bulky on lea-break; sown-out land short of straw; yielding from 28 to 35 bushels; grain average quality; seed sown, about 6 bushels.

Harvest ten days later than last year; crop secured in good condition.

Hay.—Full average; got well secured; ryegrass about 25 cwt.; seed average weight, from 24 to 26 lb. *Meadow-hay*—Above an average; little grown, but got well secured.

Potatoes.—Splendid crop, say 7 to 10 tons; tubers large, and fair quality. No new varieties. Up-to-Dates newest.

Turnips.—Below an average; a good deal of finger-and-toe; did not fill up well in October; brairded well; about 12 tons.

Not more than usual injury by insects. Weeds not above average.

Live Stock.—Pastures fairly good, but stock did not seem to thrive as usual. Butchers complained of sheep killing badly. Cattle and sheep free from disease; maggot and foot-rot more prevalent than usual. *Clip of wool*—Below an average, 10 per cent less weight than last year; quality not so good.

LANARKSHIRE (Upper Ward). *Wheat.*—None grown.

Barley.—None grown.

Oats.—About 30 to 35 bushels; about the same as last year as regards both quality and quantity; 5 to 6 bushels sown.

Harvest began at the usual time, in the beginning of September.

Hay.—The quantity and quality were good, yielding about 2½ tons; slightly better than last year. Aftermath did not come well on account of dry weather. *Meadow-hay*—Average crop, about the same as last year.

Potatoes.—About 7 or 8 tons, or nearly double that of last year. Little disease, especially in Maincrops; commenced about middle of August. Practically no new varieties were planted.

Turnips.—About 22 to 25 tons; slightly less than last year. Crop brairded well, and no resowing required. *Note.*—The cultivation of cabbage in the fields is becoming more general in this district, more particularly in cases where the land is infested with finger-and-toe. Very satisfactory crops have been obtained.

Little if any damage done by insects. In some places more damage was done by weeds than last year.

Live Stock.—Pastures fully as good as last year, especially towards end of season. Stock throve well. Cattle free from disease. A good deal of sickness among sheep has occurred in some districts. *Clip of wool*—Quality good; quantity fully average, and larger than last year

LANARKSHIRE (Middle Ward). *Wheat.*—40 bushels; quality of grain and straw very good; a more useful crop, and not so much "lodged" as in previous year; seed sown, 3 to 3½ bushels.

Barley.—Very little grown.

Oats.—A good useful crop; threshing well; yield about 36 to 40 bushels; seed sown, from 4 to 5 bushels. Owing to cold east winds in May and long drought in June the crop on stiff land was deficient in straw, but on the whole an average crop.

Harvest began same week as last year.

Hay.—Under the average, owing to drought in June; yield, 1 ton 10 cwt. to 2 tons; well secured, but very low prices out of small ricks. *Meadow-hay*—An average crop.

Potatoes.—9 to 10 tons—a heavier crop than previous year; very little disease. Varieties principally planted: Sutton's Abundance, Up-to-Date, and Maincrop. No new varieties planted.

Turnips.—Under last year. In some districts a poor crop, only lifting 10 tons; in more favoured districts up to 25 tons. Brairded well, and no second sowing.

Insects not troublesome; damage no greater than usual. Weeds as usual, and easily dealt with.

Live Stock.—Pastures deficient in early part of season owing to drought, but abundant after August; quality about the same. Stock throve not so well as previous year owing to scarcity in June and July. Cattle and sheep free from disease. *Clip of wool*—Average.

LANARKSHIRE (Lower Ward). *Wheat.*—42 bushels; 2 tons straw, and of good quality.
Barley.—None grown.
Oats.—42 bushels; a full crop, and 1¾ ton.
Harvest in this district a week earlier than last year. Some extra fine weather, then a spell of very bad weather, and very tedious.
Hay.—A splendid harvest. Ryegrass and clover, 2 tons; timothy, 3 tons.
Potatoes.—A good crop; 9 to 10 tons, and scarcely no disease. A lot of new kinds planted, and some kinds did well.
Turnips.—Scarcely an average crop this year; 20 tons; and brairded well in this district, and once sown.
Live Stock.—Pasture in the early summer was very bad and backward owing to the cold wet weather, but improved very much later on. Stock throve fairly well. Cattle and sheep free from disease.

RENFREWSHIRE. There is little variation from the report of last year to refer to. January and February were wet months, and April was not dry. May, June, and July experienced fairly fine weather, favourable for the hay crop, which, while not above an average in yield, was secured in the finest condition but very deficient in clover. The meadow-hay shared to a certain extent the same advantage, and was an average crop. The oat crop yielded in some cases more than last year, and the grain and straw were of good quality; but the weather was inferior for harvest purposes, and August and September were wet months. In cases of heavy and grassy crops much damage arose from the heavy showers and close and dull atmosphere. The root crops were unusually good, potatoes much in excess of the previous year,—May, June, and July being all that could be desired for the growth and progress of the crop. There was little or no disease. Up-to-Date and Garton's were the favourites, and great expectations are looked for from these varieties. The turnip crop had a good start, the fly giving no trouble; but they have not kept well, and there were complaints of banker and finger-and-toe. The rainfall during the year was 68·45 against 62·98 in the previous year.

ARGYLLSHIRE (Lochgilphead District). *Wheat.*—None grown.
Barley.—None grown.
Oats.—About 36 bushels; quantity and quality similar to last year; 6 bushels of seed sown.
Harvest began about the usual time.
Hay.—About 1 ton 15 cwt.; ryegrass pretty good; clover short and thin in the ground. *Meadow-hay*—Rather better than last year.
Potatoes.—A very excellent crop, far superior to last year; about 13 tons 10 cwt. Disease was pretty bad in the early varieties,—it started about the 1st of July. Scottish Triumph was planted for the first time here, and gave good returns.
Turnips.—About 26 tons; good quality; better than last year; brairded well; no second sowing.
The oat crop after lea was a little patchy, rather worse than usual—probably caused by wireworm. No special damage by weeds.
Live Stock.—Pastures during the season of average growth and quality with last year. Stock throve very well. Cattle free from disease. Sheep were affected with blindness in the beginning of autumn to a much greater

extent than in any previous years. In previous years we had a few similar cases, chiefly amongst wedders on turnips; this year it was entirely amongst ewes and lambs on foggage. It was very troublesome to cure, and it occurred amongst different lots that were quite separate from any others. *Wool*—Average clip; good quality.

ARGYLLSHIRE (District of Kintyre). *Wheat.*—None.

Barley.—Will average about 32 bushels; quality good; crop much the same as last year; seed, about 4 bushels.

Oats.—An average crop, about 36 bushels; seed sown, about 5 bushels.

Harvest began about the usual time.

Hay.—Crop in general light; would average about 2 tons. *Meadow-hay*—About the same as last year.

Potatoes.—About an average crop; average from 7 to 8 tons; very little disease.

Turnips.—Fair crop, but a good deal of finger-and-toe disease in some fields; average from 15 to 16 tons.

Very little damage; much as usual. A good deal of runches (or skellock) amongst the oats.

Live Stock.—Pastures about the average. Stock throve well, and no infectious disease. *Wool*—About an average clip; quality good.

ARGYLLSHIRE (Islands of Islay, Jura, and Colonsay). *Wheat.*—None grown.

Barley.—Very little barley is grown.

Oats.—Straw bulkier than last year, and quantity of grain more, but weight per bushel less.

Harvest about a fortnight later than an average.

Hay.—Crop rather lighter than last year, but it was secured in good order. *Meadow-hay*—A fair average crop; very similar to last year; secured in good order.

Potatoes.—Crop heavier than last year. Some fields suffered considerably from disease, but on the whole not more damage was done than in average years. Regents and the older varieties of potatoes suffered most.

Turnips.—A fair average crop, slightly heavier than last year. The crop brairded well, and in almost no case was more than one sowing required.

Grub in mossy ground was more destructive than usual. Other insect injuries not more marked than in average seasons. All common weeds grew luxuriantly, and it was extremely difficult to keep the turnip and potato crops clean.

Live Stock.—Grass was abundant owing to showery weather prevailing all summer. Stock throve fairly well, but a less luxuriant growth of grass would have been more beneficial, and had the weather been drier, both cattle and sheep would have thriven better. Disease has not been more prevalent than usual. Braxy and trembling cause the death of many sheep every year. The *clip of wool* was a fair average both in quality and quantity.

ARGYLLSHIRE (District of Inveraray). *Wheat.*—None in this district.

Barley.—None.

Oats.—About an average; straw rather short; grain from 27 to 30 bushels; not generally well saved, unless where "Corn Drier" used; not many in use yet, but much needed in this wet district.

Harvest began about usual time.

Hay.—On meadow-lands heavy and fairly saved; weight about 2 tons, but light on dry lands. *Meadow-hay*—More productive.

Potatoes.—A good crop generally; some parties complained of soft-rot in damp ground; quantity about 6 to 7 tons; disease began about digging time, principally in old varieties. New kinds did better.

Turnips.—Brairded well, but when wet weather began they got dirty with weeds, and did not grow well till later; weight from 12 to 18 tons.

No injury by insects. Weeds more difficult to manage owing to wet state of ground. All usual kinds.

Live Stock.—Pastures good, and stock throve well, and healthy; cattle and sheep free from disease. *Clip of wool*—Quite up to usual.

DUMBARTONSHIRE. *Wheat.*—About 40 bushels; grain and straw rather better than last year.

Barley.—Very little in county; 45 bushels; grain and straw much the same as last year.

Oats.—Highland districts about 28 bushels; lowland districts about 50 bushels; both straw and grain not so good as last year owing to the bad weather during harvest.

Harvest began about the usual time,—in the higher districts perhaps about a week later.

Ryegrass-hay from 1 ton 18 cwt. to 1 ton 10 cwt.; quality very good; rather better than last year; clover deficient in some districts. *Meadow-hay*—More productive than last year, and got in better order.

Potatoes.—On the high districts about 6 tons; on the low districts 8 tons; about 2 tons more than last year. Little or no disease. New variety called "British Queen," a large cropper, and good quality.

Turnips.—From 8 to 20 tons; not so good as last year; brairded well. No second sowing required.

In some fields a little finger-and-toe was observed on turnips. No injury by weeds owing to the fairly dry season.

Live Stock.—Pastures good; better than last year. Stock did not thrive as well as expected. Blackfaced hill wedders were not good. There has been very little disease. *Clip of wool* good; better than last year.

STIRLINGSHIRE (Western District). *Wheat.*—None sown in district.

Barley.—Little grown; average yield 35 bushels of good quality, and fairly well secured.

Oats.—This crop is grown to a considerable extent in the district. The yield was not quite equal to last year, and is estimated at 35 bushels. The grain and straw suffered much from the continued heavy rains at time of taking.

Harvest operations commenced a few days earlier than last year, under favourable circumstances; but unfortunately the weather soon broke, and continued so long broken, with the result that the harvest was protracted and not concluded till late in September.

Ryegrass-hay was a good crop, easily and well secured under favourable conditions, and would average 33 cwt. Except in one or two instances there was an almost entire absence of clover, generally attributed to the frost after sowing. *Meadow-hay*—Less productive than usual; pretty well secured in the lower parts, but prejudicially affected by the rain in the upland and later parts of the district.

Potatoes.—A good crop, digging to from 9 to 10½ tons; fine quality; very little disease. Kinds chiefly grown, Sutton's Abundance and Main-crop. No new varieties planted.

Turnips.—Early sown; a heavy crop of fine quality of from 30 to 43 tons; later sown rather a light crop.

No injury by insects. The crops were not injured by weeds to any appreciable extent.

Live Stock.—The pastures were of average growth and quality in early part of season, and, from the great moisture and heat, of exceptional growth, but not of the same quality in the latter part of it. As a rule stock throve fairly well. It has to be noted, however, that though there was the great rush of grass in autumn from the cause above mentioned, it did not possess the substance of pasture grown under more normal conditions. Cattle and sheep free from disease. The *clip of wool* was of good quality and of average quantity.

STIRLINGSHIRE (Eastern District). *Wheat.*—3½ bushels for seed on clay land; ½ bushel less on dry field. One of the best crops for grain and straw that we have had for some years. Yield—clay, 46 bushels; dry field, 38 bushels. Straw, big crop. Largest acreage for some years.

Barley.—A good crop; 3 bushels seed. Best barley year for some years, grain weighing very heavy, not an uncommon weight 60 lb. per bushel. Straw good, and also yield from 26 bushels to 40 bushels.

Oats.—5 bushels seed; grain good quality, but straw very short; 26 bushels to 36 bushels yield.

Harvest earlier than usual. Very good in early districts, but somewhat protracted in later districts.

Hay.—Carse, 2 tons; dry field, 30 cwt.; meadow, fair crop; some not well secured. *Meadow-hay*—Not so good.

Potatoes.—Yield from 8 tons up; quality all good, but prices small. No new varieties.

Turnips.—Dry-field turnips very good; carse of middling quality and short of weight, on account of very dry weather when brairding; some second sowing.

No damage by insects.

Live Stock.—Pastures middling summer, but very good autumn. Stock throve very well. Cattle and sheep free from disease. *Clip of wool*—Below average; not nearly so good as last year.

CLACKMANNANSHIRE. *Wheat.*—48 bushels; 30 cwt. straw; very good crop; seed sown, 3 bushels.

Barley.—32 bushels; 20 cwt. straw; much the same as last year; seed sown, 3 bushels.

Oats.—44 bushels; 25 cwt straw; grain a good yield; straw under average; seed sown, 4½ bushels.

Harvest commenced last week of August, average time.

Hay.—Fully 2 tons; splendid quality.

Potatoes.—8 tons; much better than last year. Disease commenced well on in the season, but not to any great extent. Up-to Date was the only new variety. Very good cropper.

Turnips. — 25 tons; very good crop; came away well; no second sowing.

No injury by insects. Very little damage by weeds.

Live Stock.—Pastures fair average growth. Stock throve well, and were free from disease.

FIFESHIRE (Eastern District). *Wheat* —Quantity, 44 bushels; quality good, about the same as last year; crop better than last year; straw, 1½ ton; seed sown, 3 bushels.

Barley. — Quantity, 40 bushels; quality good; crop better than last year; straw, 1¼ ton; seed sown, 3 bushels.

Oats.—Quantity, 44 bushels; quality good; crop better than last year; straw, 1¼ ton; seed sown, 4 bushels.

Harvest began at the usual time.

Hay.—Quantity, 2 tons; quality good; about an average crop. *Meadow-hay*—Very little grown in this district.

Potatoes.—Yield, 6 tons 10 cwt.; crop much better than last year.

There was no disease when lifted, but since being pitted about a quarter of the crop of Bruces and Farmer's Glory have gone with disease. Up-to-Dates and Good Hopes are the only new varieties, and both are large croppers.

Turnips.—Swedes yielded 20 tons and yellows 14 tons; an average crop. They brairded well. Only one sowing was required.

No damage was done by insects. No injury was done by weeds.

Live Stock.—Pastures were short of average growth, owing to the long spell of dry weather. Stock throve well. Cattle and sheep have been free from disease. *Clip of wool*—About an average.

Fifeshire (East Neuk). *Wheat.*—At least 40 bushels; best crop since 1868; quality equal to last year's extra fine quality; straw about 1¾ ton; seed sown, 3 bushels.

Barley. — 42 bushels; quality good; quantity considerably over an average; bulk under average, about 1 ton. Where sown with drill, 2 to 2½ bushels; by hand, 3 to 3½ bushels.

Oats.—48 bushels; quality good; straw generally very short; quantity ranging from ½ ton to 1½ ton.

Harvest a week earlier than last year, and was very favourable, mostly everything being led within the month in grand order.

Hay.—About 1½ ton; under average crop, but very fine quality, as the weather was perfect for haymaking. Little second crop owing to drought. *Meadow-hay*—None grown except on higher districts, where the crop was above an average.

Potatoes. — An extra crop; average yield over 6½ tons; Bruce and Farmer's Glory badly diseased. Disease began about middle of October owing to excessive wet. Good Hope is a new sort.

Turnips. — Swedes, 20 tons; yellows, 14 tons; quality good; little resowing. Worm ate round below stalk, and some fields showed numerous blanks immediately after thinning. Turnip-louse did considerable damage in August.

Charlock and runches did considerable damage where indigenous. Rather more owing to backward spring and dry summer.

Live Stock.—Grass was plentiful early in the year, but owing to continued drought got very scarce; quality good. Stock did very well for a time, but during the dry spell fell off in condition. No disease except an occasional case of anthrax. *Clip of wool*—About an average as to quality and quantity.

Fifeshire (Middle District). *Wheat.*—44 bushels. The quality of both grain and straw is excellent. There is a better yield of grain, and the weight of straw is heavier. The quantity of seed used is from 3½ to 4 bushels. Weight of straw, 2 tons.

Barley.—48 bushels is a common yield of this grain. The colour and quality, owing to the dry weather before and during harvest, very good. The weight of straw will be fully 1½ ton heavier than last year's yield. Seed generally sown, from 4 to 4½ bushels.

Oats.—Owing to the drought in the end of June and during the greater part of the month of July, this crop is the lightest of the cereals, both in yield of grain and weight of straw. 48 bushels will be a full average yield; the weight of straw not more than from 25 to 28 cwt. Quantity of seed used, 6 bushels.

Harvest was begun about the 15th of August, which is about two weeks before the average time. The weather was fine, which allowed the whole crop in this district to be secured in good condition.

Hay.—The crop was also a particularly heavy one, and was well mixed with clover. It was considerably heavier than the crop of 1897. The average weight this year will be about 2 tons. It was well got; secured, all of it, in excellent order. *Meadow-hay*—Scarcely so good as the crop of last year; 1 ton 10 cwt. will be a full average.

Potatoes.—The crop in this district was a record one. Never before have we had such an abundant one; the season seemed to have suited this esculent. 10 tons and even 12 tons yield have not been uncommon, but the average may be stated at 7½ to 8 tons. No disease; no new varieties. Up-to-Date the latest, and it is a heavy cropper.

Turnips.—The crop brairded quickly and regularly owing to showery weather about the beginning of June. No second sowing was required. The average weight of yellows will be scarcely equal to that of last year—15 tons; whereas swedes will very closely approximate to the crop of 1897—from 20 to 22 tons. The crop has improved very much since the beginning of October.

No damage by insects to grain crops. Wireworm did some injury to turnips; only average loss. Very little injury caused by weeds.

Live Stock.—Pastures were better than they were last year, more especially in the autumn. Stock throve very well, and were free from disease. *Clip of wool* of average quality.

FIFESHIRE (Western District). *Wheat.*—On the best coast lands—quantity, 44 bushels; weight of straw, 35 cwt.; quality of both very fine; quantity of seed sown, 3½ to 4 bushels. In the poorer back-lying districts not much wheat sown, but the average quantity of any grown will be, say, 36 bushels; weight of straw, 35 cwt.; quality of both grain and straw good; seed sown, 4 bushels.

Barley.—On the best lands—quantity, 56 bushels; weight of straw, 35 cwt.; quality of both fine; 3½ bushels of seed sown. On the secondary lands—quantity, 44 bushels; weight of straw, 27 cwt.; quality of both good; seed sown, 4 bushels.

Oats.—On the best lands—quantity, 48 bushels; 25 to 30 cwt. of straw; quality of both very fine; seed sown, 4 bushels. On the poorer lands—quantity, 44 bushels; 25 to 30 cwt. of straw; quality of both fine; seed sown, from 4 to 5 bushels.

Harvest began on 22nd August, about a week earlier than the season before, or what is usual.

Hay.—Quantity on the best lands, 2 tons; quality fine. On the poorer soils—quantity, 1 ton to 30 cwt.; quality fine. *Meadow-hay* was a good crop.

Potatoes.—Crop good and abundant on both the best lands and also the inferior—6 tons on the former and 5 tons on the latter. Quality in both cases fine. No disease in the later varieties, but a considerable part of the earlier sorts are badly affected.

Turnips.—Swedes a very fine and full crop, say 20 to 25 tons—in some cases more. Yellows generally a poor crop, of bad quality, and much affected by finger-and-toe. On hard lands the braird was indifferent, and in some cases resowing had to be resorted to—frost and frosty winds the cause.

No damage to speak of by insects. No damage by weeds, except when badly farmed.

Live Stock.—Pastures were good, but cattle did not flesh well. Cattle and sheep perfectly free from disease. *Clip of wool*—Much the same as last year.

PERTHSHIRE (South-Western District). *Wheat.*—3½ bushels seed; produce, 40 bushels; straw plentiful and of good quality; better yield of grain than last year; about an average area under wheat.

Barley.—3 bushels seed; produce on carse land, 32 bushels; dry-field land, 32 bushels; straw good; not such a large area sown as last year.

Oats.—4½ bushels seed, and in some cases more; produce, 36 bushels; grain fully better sample than last year, and yield of straw about average.

Harvest began about average time, but fully ten days earlier than in 1897.

Hay.—Heavier crop and better quality than last year; well got, but the second-crop hay was badly damaged by weather. Average of first crop 2 tons 5 cwt. on carse land, 35 cwt. on dry field. *Meadow-hay*—Heavier crop than last year.

Potatoes.—About double the yield of 1897. The average yield was probably about 7 to 9 tons. Yes, a good deal of disease, mostly amongst the older varieties. Sutton's Abundance and Maincrops seem to be the principal kinds planted.

Turnips.—About 18 tons; quality not so good, nor yet was the quantity up to last year's crop; brairded badly, but not much resowing required. Turnips seem thin on the ground.

No damage to speak of—in fact less than usual. Usual crop and kinds of weeds.

Live Stock.—Pastures during the season of average growth and quality with last year. This part of Scotland did not suffer so much from drought as some of the counties farther north. Stock did fairly well on the pastures; but the early spring caused stock to be very dear to buy in, and they left little or nothing for the summer's keep. Cattle and sheep free from disease. *Clip of wool*—Fully an average.

PERTHSHIRE (Coupar-Angus District). *Wheat.*—The average yield in this district will be rather more than last year, from 38 to 44 bushels, with more straw, and quality of grain also superior; seed sown, from 3 to 3½ bushels.

Barley.—This crop is superior to that of last year both in quantity and quality of grain and straw, yielding from 40 to 50 bushels; seed generally sown, from 2½ to 3 bushels.

Oats.—A fair average crop; quantity and quality of grain good, but yield of straw rather less; seed generally sown, from 3½ to 4½ bushels.

Harvest began about the usual time, on the last week of August, and weather being favourable, the crops were generally all well secured within four weeks.

Hay.—A full crop of excellent hay of good quality, but rather deficient in clover; yielding from 2 to 3 tons. *Meadow-hay*—Very good what was of it, but comparatively little made of it in this district.

Potatoes.—The crop this year is fully more than an average one, more than double that of last year, and of superior quality, with very little disease; yield from 8 to 12 tons of marketable potatoes.

Turnips.—A good average crop, but scarcely equal to that of last year; quality, however, generally good, and comparatively free of finger-and-toe; average weight about 20 tons. Crop brairded well, and no second sowings required.

There has been very little damage to the crops by insects this year, and where crops are good no damage by weeds.

Live Stock.—The pastures were of average growth and quality with last year, and live stock of all kinds did well. Cattle and sheep comparatively free from diseases of any kind. An excellent *clip of wool*, both as to weight and quality.

PERTHSHIRE (Strathearn District). *Wheat.*—Very little grown; a fair average crop; 35 to 45 bushels; 3 to 4 bushels sown.

Barley.—A full average crop; 40 to 50 bushels. Bright and fine as the season was, barley was in many cases dark in colour and unequally ripened.

Oats.—An average crop; 45 to 50 bushels; 4 to 5 bushels sown. Lea corn short in straw; red-land corn a full crop both in corn and straw, and grain well filled and turning out well on threshing-floor.

Harvest two to three weeks earlier than usual. In some cases cutting finished in August. In late districts harvesting was much delayed by wet weather and little or no drying weather even in early districts, so that on the whole harvest was a protracted one.

Hay.—Crop, very much contrary to expectation, turned out a full average one, and in some instances proved a very heavy crop; well secured; average 1½ to 2 tons; well mixed as regards clover and rye-grass. *Meadow-hay*—Less productive than last year, but secured in good condition.

Potatoes.—Crop a very good average one; 6 to 7 tons, in several cases 10 to 12 tons, and pretty free of disease. Maincrop and Abundance were the principal kinds grown.

Turnips, contrary to expectation, turned out a good crop, except in cases where wireworm played havoc; not much second sowing; average, 16 to 20 tons; quality, especially yellow, rather deficient, and notwithstanding in many cases a large crop, yet standing very little eating.

No injury to grain crops by insects, turnips only suffering by grub and wireworm; damage less as regards grain crops, and more as regards turnips. There was little or no injury by weeds, and damage less than usual.

Live Stock.—The pastures suffered considerably from the drought, except on well-farmed heavy land, but towards the end of the season were much improved by the late rains. Stock throve wonderfully well, except where the pastures were much burned up. Cattle and sheep have been free of disease. *Clip of wool* was an average in quantity and quality.

PERTHSHIRE (Highland District). *Wheat.*—None sown.

Barley.—30 bushels; 53 lb.; sown, 4 bushels; straw good in heavy land, but not so in light land; straw only fair in quality.

Oats.—Lea oats, 43 bushels; 43 lb. Clean land, 36 bushels; 41 lb. 5 bushels sown; straw was excellent in quality, but not bulky.

Harvest began a little earlier than usual. The weather was excellent, and the crops well secured.

Hay.—As good as last year and excellent in quality; 20 cwt., and well secured. *Meadow-hay*—Fully better than last year, and well got.

Potatoes.—6 tons; slight disease. Up-to-Date was the better crop. The potato crop all over was the best of the season.

Turnips.—20 tons; some places better than others, and quality good; early sown better than late, and brairded well. No second sowing required.

No insects. Few weeds, on account of the dry weather.

Live Stock.—Pastures good in the beginning and end of season. In mid season not so good, through the dry weather. Stock throve well, and were in good condition. Cattle and sheep were free from disease. *Clip of wool*—Quality and clip fully better than last year.

FORFARSHIRE (Western District). *Wheat.*—50 bushels; quality of both grain and straw extra good owing to the fine weather; seed, 3 bushels.

Barley.—56 bushels; quality of grain and also of straw first-class; seed, 4 bushels.

Oats.—From 30 bushels to 96 bushels, the yield being above an average where the land was in anything like order; quality of grain and straw first-rate, owing to the good harvesting weather.

Harvest commenced from 14 to 18 days before the usual time.

Hay.—About 2 tons; of first-rate quality.

Potatoes.—The potato crop was a very good one; from 8 to 10 tons of dressed potatoes; more than double last year's crop; no disease, and very few, if any, new varieties planted in this neighbourhood.

Turnips.—From 24 to 33 tons; quality of swedes good where not mildewed,—the same applies to yellows, which would weigh from 15 to 30 tons.

No injury by insects to speak of. Not much, if any, injury from weeds, as the season was so dry one could get them kept down.

Live Stock.—Pastures during the season of average growth and quality with last year. Stock did fairly well. Cattle and sheep free from disease. *Clip of wool*—A full average.

FORFARSHIRE (Eastern District). *Wheat.*—40 to 45 bushels; good quality and well saved in harvesting; straw under average; 3 to 4 bushels sown.

Barley.—40 to 48 bushels of excellent quality; straw much under average; 4 bushels sown.

Oats.—45 to 50 bushels; good quality; straw very short owing to want of rain during growth; 4 to 6 bushels sown.

Harvest began about 22nd August, rather earlier than 1897. Weather good, and crops saved in excellent condition.

Hay.—Light crop, about 3 tons; fairly good quality, but slightly deficient in clovers. *Meadow-hay*—None in district.

Potatoes.—About double last year's crop; average from 8 to 10 tons, in some cases as high as 14 tons; quality good; no disease to speak of.

Turnips.—Much under last year's crop, about 18 to 20 tons average; exceptional cases as high as 28 tons where not affected by drought and mildew.

Crops not injured by insects; but autumn-sown wheat much torn up by crows, which in this district are becoming alarmingly numerous. Oat crop injured a good deal by skellocks.

Live Stock.—Pastures poor owing to want of rain. Stock throve very well. Cattle and sheep free from disease. *Clip of wool*—Full average clip; prices very low.

ABERDEENSHIRE (Buchan District). *Wheat.*—Not grown in this district.

Barley.—The crop was both more extensive and a better out-turn than last year, the straw being perhaps shorter; weight from 54 to 56 and 57 lb., and in some cases even more; quantity sown, from 3 to 4 bushels.

Oats, owing to the dry season for a considerable time previous to harvest, did not look to be such a heavy crop as last year, more especially oats after turnips. The crop was secured in excellent order, and has yielded far more corn and better quality than last year, even although the straw was much shorter. Weight of grain, from 40 to 44 lb. per bushel; quantity sown, about 6 bushels; out-turn, 40 bushels, and in many cases much more.

Harvest was commenced about 1st September, and was about a week earlier than last year. The weather was all that could be desired throughout.

Hay.—The crop was above an average, and was secured in splendid condition. *Meadow-hay* is not much cultivated in this district.

Potatoes.—The yield this year is not at all regular, some crops very heavy and others not an average, but all, as a rule, of very fine quality; very few cases of disease.

Turnips.—Not so good a crop as last year by a long way. Swedes, 15 to 20 tons; yellows, 14 to 16 tons, and are not so good in proportion to swedes. Neither have bulked so well owing to the wet state the land was in when sown and the continued dry weather throughout the later part of the season.

No damage done by insects. Weeds were not so bad as in many seasons, even although the land was badly made.

Live Stock.—The pastures, owing to the wet forepart of the season, were fully an average, especially the latter part of the season, when they might be characterised as luxuriant. The stock did not do so well at first, but afterwards did better on the pasture. Cattle and sheep were free from disease. *Clip of wool*—About an average ; price very low.

ABERDEENSHIRE (Formartine District). *Wheat.*—None grown.

Barley.—Last year 37 bushels; this year 37 bushels; straw 5 per cent less than last year ; seed sown, 4 bushels. The bushel weight of the grain is 2 to 3 lb. over average, and being well secured, the quality of both grain and straw is excellent.

Oats.—Last year 39 bushels ; this year 42 bushels ; straw 10 per cent less than last year ; seed sown, 5½ bushels, but on high-lying land 6½ bushels ; quality of grain and straw excellent.

Harvest began about the usual time, and the weather was all that could be desired.

Hay.—" Seeds "—*i.e.*, ryegrass and clover mixed—are cut for hay, and yielded last year 27 cwt. ; this year 30 cwt. ; quality excellent. *Meadow-hay*—Practically none grown here.

Potatoes.—Last year 4½ tons ; this year 7 tons ; of excellent quality, and almost free from disease.

Turnips.—Last year 20 tons ; this year 15 tons. Crop brairded badly, much of the land having been worked in bad condition owing to heavy rains in May.

Usual damage from turnip-fly, which always works when the braird is sickly. Not much injury by weeds, but couch-grass and knot-grass are holding their own.

Live Stock.—Pastures were fairly good ; perhaps scarcely so good as last year. Live stock throve fairly well. Cattle and sheep free from disease.

ABERDEENSHIRE (Garioch District). *Wheat.*—None grown.

Barley is the crop of the season, both as regards straw and grain. The crop came to maturity in all the late districts, and the weight is above that of many years—58 lb. and even 59 lb. per bushel is quite common. The quantity usually sown for seed is 4¼ bushels, and the average yield would be 40 bushels.

Oats.—The straw on the oat crop is not so rank as last year. The drought in the months of June, July, and August was against that cereal, but the grain is heavy and turning out well. Straw will be scarce, but the crop was splendidly harvested, and the yield will be 42 bushels, after a sowing of 6 bushels.

Harvest was begun about the 30th of August, or a week or so later than usual. The cutting of oats was commenced a few days after the 30th of August.

Hay.—The crop was not quite up to last year, the drought in the month of June lessened the quantity, but it was well mixed with rye and clover, and was well harvested. The weight would be about 1½ ton. There is no *meadow-hay*.

Potatoes.—The crop this year was very good, above that of last year, and keeping well in the pits. No disease heard of, and the weight would be about 4 tons. Very few new varieties planted.

Turnips.—The turnip is considerably less than last year, but the quality is very good, and stock have thriven well. There was a deal of second sowing in the early part of the season; the first sowing did not make an appearance and a second sowing was required, which did very well, although the bulbs were small in consequence. Swedes and yellows are about the same weight, and may be stated at 17 to 24 tons.

No insects. The crops suffered no injury from weeds.

Live Stock.—The pasturage grass was very good throughout the whole season, and stock throve well upon it. No disease of any consequence has attacked the cattle or sheep this year. *Clip of wool*—Similar to last year, both in quantity and quality.

Aberdeenshire (Strathbogie District). *Barley.*—There was a considerable increase in the area put under barley. The season being favourable—dry and warm—the crop was early, and was got well secured in the stackyard. From the steam thrashing-machine heavy weights are the rule, ranging from 56 to 58 lb. There is great differences in the return of grain, and 5 quarters may be stated as a general average.

Oats.—In many instances the quantity of straw was somewhat deficient and under an average. Oats on lea were generally a satisfactory crop, but after roots rather poor, especially in straw. The quality of grain is good, and the weight ranges all the way from 40 lb. up to 45 lb. 42 lb. may be stated as a general average weight.

Harvest.—Barley harvest began about a week earlier than the usual time, and as there was an extended area under that cereal, together with fine weather for reaping, cutting was well forward before the season was far advanced.

Hay.—The crop was generally short in bulk, but being made in good weather the quality was excellent. An average crop may be stated at 35 cwt.

Potatoes.—Generally the crop was good, and the quality of the tubers excellent. There was no disease in the district.

Turnips.—The crop is somewhat under an average. On stiff land, owing to the dry weather, the plants were remarkably stiff in coming to the hoe, and on such land they have not matured to be a good crop. The season up till the present has been favourable for economising roots, and it is well, as they are expected to be generally scarce by spring.

There was no injury done by insects during the past season.

Live Stock.—The pastures were generally good during the season, and stock of all kinds did well upon them. It is always noticeable that animals thrive better in a warm season than in a cold one, even although pastures be barer. There has not been any disease amongst the stock during the past season. *Clip of wool*—The quality was better than it has been for the past few seasons. The difference was, perhaps, more noticeable on hill stocks than on sheep fed on the low ground. All stock-owners complain bitterly of the low prices that the clip now realises as compared with a number of years ago; but as far as the producer is concerned, there is no help for it.

Banffshire (Lower District). *Wheat.*—Very little or none grown.

Barley.—A large breadth sown, which gave an average crop, both of straw and grain, the latter of good quality and heavy weight, 58 to 60 lb. being not uncommon; quantity would be slightly less perhaps than last year, say 3½ to 5½ quarters; seed sown, about 4 bushels.

Oats, like the barley, is an average crop, and turning out, on being handled, better than expectation, both as regards quantity and weight, no doubt owing to the high temperature which prevailed in August fully maturing the grain. It is of beautiful quality, and the weight up to 48 lb., and hardly anything below 43 lb. After turnip crop again brings down the average yield, which may be stated at about 40 bushels. Seed sown, 5 to 6 bushels.

Harvest about a week later than former year. Emphatically a September harvest, beginning with the month and all finished up by the end of it. Many farmers are now harvesting the oat crop at an earlier stage of ripeness than used to prevail, and this they believe, from experience, with considerable advantage, the best of the grain being preserved, which is most easily shed when over-ripened, "John often being lost waiting for sock," as the old saying has it. The Binder is also an important factor in preserving the grain, as well as shortening and lessening the risk of the harvest.

Hay.—Under an average; quality good, fairly mixed; quantity say about 25 cwt. *Meadow-hay*—Hardly any.

Potatoes.—Much better than expected as a growing crop; quality excellent; quantity about same as last year—3½ to 4½ tons; very little disease. The Champion variety, which was being superseded in some cases by other varieties, looks as if it will still hold the field as one of the best all-round field potatoes.

Turnips.—Not so big a crop as last year, which turned out better than expectation—perhaps 2 to 3 tons below last year; growth was stiff for a time after hoeing, perhaps owing to the weather, much of the earlier sown not being in good condition. Quality good; not much second sowing required.

Little or no damage by insects. Damage by weeds in some cases, the land, owing to the wet spring, not being so well cleaned as usual.

Live Stock.—Pastures much about the same, both years below 1896. Stock throve fairly well. Cattle and sheep free from disease on the whole. *Clip of wool*—I suppose an average.

MORAYSHIRE (Lower District). *Wheat.*—Very fine crop. On one farm in Moray over 40 acres were valued over to an incoming tenant at 49 bushels an acre. Yield generally good, and quality excellent. Average would probably be about 40 bushels, fully as high as last year; about 4 bushels sown.

Barley.—Excellent crop; fully average bulk; grain unusually superior alike in weight and quality—58 lb. quite common. Colour particularly good. Yield much the same as last year—44 bushels; 3 to 4 bushels sown.

Oats.—Not so heavy as previous year, but a big fine crop, yielding about 50 bushels of superior grain weighing 43 to 44 lb., and frequently 45 lb., occasionally 46 and 47 lb.; about 4 bushels sown.

Harvest began about usual time—20th to 25th August.

Hay.—Crop better than last year, yet not heavy. Several fields went over 2 tons; average would be about 1½ ton. Clover fully as abundant as usual. Ryegrass strong in growth, but thin on the ground. *Meadow-hay*—Scarcely any.

Potatoes.—Better than last year, and quite healthy. Yield would vary from 5 to 10 tons; average probably 7 tons; quality exceptionally fine. Magnums as good on the table in autumn this year as either Cups or Maincrops.

Turnips.—Not so heavy a crop as in 1897, even where they are best. Much canker on many farms worked in five shifts; none where rotation is seven shifts or more. Summer prospects, except for canker, excellent; but autumn growth not equal to last year's. 28 tons seldom reached; 24 to 25 much more common; 20 tons frequently not exceeded.

No injury by insects. No special injury by weeds.

Live Stock.—Pastures during the season of average growth and quality with last year. Stock throve very well in the early part of the season;

not quite so well towards the end of it. Catttle and sheep free from disease. *Clip of Wool*—Good ; rather over average.

NAIRNSHIRE. *Wheat.*—None grown.

Barley.—34 bushels ; grain and straw better in quality ; 4 bushels sown.

Oats.—40 bushels ; better ; 5 to 6 bushels sown.

Harvest about a week earlier.

Potatoes.—Yield about equal to last year ; very little disease. A few, with very good results.

Turnips.—Yield not so heavy ; a good deal of finger-and-toe or canker ; brairded well. No.

Gummed owing to dry weather at certain stage. No injury by weeds.

Live Stock.—Pastures during the season of average growth and quality with last year. Stock throve very well. Cattle and sheep free from disease.

INVERNESS-SHIRE (Inverness District). *Wheat.*—The crop was small in area, but the return in quantity and quality was very satisfactory ; quantity sown, from 3 to 4 bushels, according to condition and quality of land.

Barley.—The yield is a full average, while the quality is a maximum ; quantity sown, from 3 to 4½ bushels. The crop was harvested in fine condition.

Oats.—The yield was exceptionally good, and the quality very fine, no damage of any kind occurring to grain or straw ; quantity sown, 3½ to 5 bushels ; yield, from 30 to 45 bushels.

Harvest about the usual time.

Hay.—A full average on best lands ; quality and condition good ; average about 1½ ton on fair land, to 2½ tons on best land. *Meadow-hay*—None grown.

Potatoes.—The yield was about an average, from 5 to 8 tons ; quality excellent, and no disease of any kind prevalent.

Turnips.—The crop, with few exceptions, is under an average. They brairded all right, but more than an average area of the crop was affected by finger-and-toe.

No injury by insects. No injury by weeds, except some oats and barley fields where charlock did severe damage.

Live Stock.—Pastures about an average. Stock throve very fair. Cattle and sheep free from disease. *Clip of wool*—Average.

INVERNESS-SHIRE (Island of Skye). *Wheat.*—None grown.

Barley.—None grown.

Oats.—Generally good, giving up to six bolls of a return. The quantity sown of seed is about a boll.

Harvesting started usual time with exceptionally fine weather.

Hay.—The crop is in advance of last year as to quantity and quality. *Meadow-hay* is more productive this year.

Potatoes.—The crop is very deficient in many places, down to the half, and the quality inferior.

Turnips.—The crop is very far short, down to the half on many farms. It is supposed the wet cold season caused the deficiency.

I am not aware that the turnips suffered by insects this season. The weeds were very difficult to keep down on account of the wet, and required continuous attention.

Live Stock.—The pastures were not so good as last year. Stock did not thrive scarcely as well as last year, but were perfectly free from disease. *Clip of wool*—About an average.

INVERNESS-SHIRE (Lochaber District). *Wheat.*—None grown.

Barley.—Almost none grown.

Oats.—28 bushels ; quality of straw and grain good ; 6 bushels sown.

Harvest.—Oats were cut much earlier this year, and harvest was correspondingly earlier in the district.

Hay.—1¼ ton ; quality good on the whole. *Meadow-hay*—Good crop.

Potatoes.—5 tons ; very little disease ; disease did not show till beginning of October.

Turnips.—12 tons ; quality bad ; mostly gone with finger-and-toe ; brairded well ; only one sowing required.

No injury by insects or weeds.

Live Stock.—Pastures above average growth and quality. Stock throve very well. Cattle and sheep free from disease. *Clip of wool*—Average.

ROSS-SHIRE (Dingwall and Munlochy District). *Wheat.*—More grown this season than last ; quantity of grain fully average, also quality ; quantity of straw, and quality, fair average ; seed, 4 bushels.

Barley.—Quantity and quality of grain considerably over average, say 44 bushels ; quantity and quality of straw average ; seed sown, 4 bushels.

Oats.—Quantity and quality of grain both over average, say 48 bushels ; quantity of straw below average, quality fine ; seed, 4 to 5 bushels.

Harvest began on 22nd August, rather later than usual ; was got over in 28 days or thereby ; weather favourable.

Hay.—Quality of crop very fine ; ryegrass and clovers grew well ; quantity, say 1⅓ ton. Hay was fairly well got. *Meadow-hay*—None grown.

Potatoes.—The crop yielded better than last season, say 8 or 9 tons ; quality of roots very fine ; scarcely any disease ; no new varieties.

Turnips.—Crop not average. Swedes, 22 to 23 tons ; yellows, 12 to 13 tons. Finger-and-toe much more prevalent ; earlier fields much spoiled by mildew ; crop brairded slowly, owing to cold nights, which caused some resowing.

Not more than usual injury by insects and weeds. Annual weeds grew more freely.

Live Stock.—Pastures were of average growth and quality. Drought threatened at one period, but was not serious. Stock throve well. Cattle and sheep free from disease. *Clip of wool*—Fair average.

ROSS-SHIRE (Tain, Cromarty, and Invergordon District). *Wheat.*—36 to 38 bushels, and very fine quality ; 3½ to 4 bushels ; very fine ; extra heavy weight.

Barley.—40 bushels ; very fine ; extra heavy weight.

Oats.—42 bushels ; over average quality and colour ; short in straw.

Harvest began generally about 20th August, the usual time.

Hay.—1½ ton ; fine quality ; fully the usual quantity of clover. *Meadow-hay*—None grown.

Potatoes.—Varied, not equal, but on the whole up to last year ; 6 to 7 tons ; no disease.

Turnips.—19 to 21 tons ; quality not so good as last year ; brairded not so well ; a little resowing.

Crops not injured by insects. Severe dry weather for a time affected growth. Weeds not greater than usual.

Live Stock.—Pastures not average ; growth and quality better. Stock throve well owing to warm weather. Cattle and sheep free from disease. *Clip of wool*—Bare ; average weight ; good quality.

SUTHERLAND. *Wheat.*—None grown.

Barley.—Below average, both corn and straw ; good quality and fair weight ; 30 to 32 bushels ; seed sown, 3 to 3½ bushels.

Oats.—On all the light and dry lands crop suffered from drought. 30 to 34 bushels ; quality good ; seed sown, 5 to 6 bushels.

Harvest a week to ten days later.

Hay.—This crop was generally good and above average, 1½ to 1¾ ton. *Meadow-hay*—More ; a good crop.

Potatoes.—6 to 7 tons ; a little disease in places. No new varieties.

Turnips.—Both in quantity and quality much below last year. Swedes, 15 to 18 tons ; yellows, 12 to 15 tons. Brairded pretty well, afterwards suffered for want of rain.

On some lea-fields grub prevalent and did damage. Not more than usual damage by weeds.

Live Stock.—Pastures good early part of season, but suffered seriously from drought after June. Stock throve fairly well. Cattle and sheep free from disease. *Clip of wool*—Quality good ; slightly over average.

CAITHNESS-SHIRE. *Wheat.*—Not grown.

Barley.—An excellent crop of about 5 quarters, weighing 54 to 56 lb. per bushel ; seed, 4 bushels.

Oats.—A good crop of both straw and grain, yielding 5 to 6 quarters, with grain weighing 40 to 44 lb. per bushel ; quantity of seed, 4 to 5 bushels.

Harvest began about the usual time.

Hay.—A well-mixed crop of about 2 tons ; secured in good order. *Meadow-hay*—Fair, and got in good order ; much more productive.

Potatoes.—Crop sound, and when put in fairly well a good crop ; 5 to 6 tons on late farms. Crop proved blanky and unproductive.

Turnips.—Crop very middling, with plenty of disease in the form of finger-and-toe and anbury. Braird came fairly well, but a wet spring retarded growth. Weight of crop an unknown quantity, with no lasting when being eaten.

No insect attacks. The dry season prevented the growth of weeds.

Live Stock.—Pastures fair. Stock of all kinds did well on grass, but many sold at prices less than when purchased in spring. Cattle and sheep free from disease. *Wool*—Over an average, but clip almost unsaleable.

ORKNEY. *Wheat.*—None grown.

Bere.—The average yield was about 32 bushels, weighing about 48 lb. ; seed sown, from 3½ to 4½ bushels.

Oats.—The quantity and quality of both grain and straw were good, and the yield more than last year, the average of grain being about 32 bushels, weighing about 40 lb. ; seed, 4 to 6 bushels.

Harvest began ten days later than last year, and about a fortnight after the usual time.

Hay was a much better crop than last year ; quantity about 25 cwt.

Potatoes were a poor crop, only about half the yield of last year ; weight about 3 tons.

Turnips brairded well. There is some finger-and-toe, and the crop is not so good as last year ; weight about 10 tons.

There was very little damage done by insects. There were a good deal of weeds in turnip crop.

Live Stock.—Pastures were good all season, and much better than last year. Stock throve well, and with one or two exceptions were free from disease. The *clip of wool* was an average.

Owing to a late seed-time and cold wet weather in July the cereal crops were very backward about the end of that month, but fine warm weather in August and September improved the oats immensely, but came rather late for the bere crop, which ripens earlier than the oats. Potatoes and turnips suffered also from the cold wet weather in July, and some turnips were laid down in rather damp weather, which accounts for the finger-and-toe.

SHETLAND (Island of Unst). No *wheat.*

Barley.—Only sown in small patches by crofters. Crop about an average.

Oats.—Quality of grain not so heavy as last year; straw heavier; about 6 bushels of seed sown.

Harvest began about the usual time, but about eight to ten days later than last year.

Hay.—Ryegrass generally lighter than last year, owing to late and cold spring. *Meadow-hay*—On wet ground not so heavy as last year, but on high ground heavier.

Potatoes.—Weight in tons not known; average crop; quality very good; no disease; no new varieties planted.

Turnips.—An excellent crop, above the average, and roots of excellent quality. Early sown brairded well and evenly, and were soon ready for thinning; late sown, owing to period of cold weather, seriously retarded, and in some cases second sowing necessary.

No damage by insects. Ground fairly clean throughout.

Live Stock.—Grass very late, and pastures extremely bare during May and June; rapid growth during July and August, and grass continued growing till November. During early summer stock kept very backward in condition, but towards end of the summer came up in condition rapidly. Sheep and cattle free from disease. *Clip of wool*—Quality fairly good; yield about an average.

SHETLAND (Lerwick District). *Wheat.*—None.

Barley and Oats.—Defective both in quantity and quality; yield much below last year. The summer has been cold and wet.

Harvest a fortnight behind usual time.

Hay.—The quality of the hay crop, both ryegrass and clover, is good. The yield in quantity is below last year. *Meadow-hay*—Fully one-third less productive than last year.

Potatoes.—The crop slightly inferior to last year; in quality good and sound; no disease to speak of.

Turnips.—What turnips there are are good, but the weight is far below last year. The crop did not braird well, and in some places a second sowing was required. The weather was cold and windy.

No damage by insects. Very little damage from weeds. Average.

Live Stock.—The pastures were fair, but average growth and quality below last year. Stock did not thrive as well as usual on pasture, owing to the cold weather. Cattle and sheep fairly well, but not up to the average. *Clip of wool*—Quality is fair, but under the average in weight.

THE METEOROLOGY OF 1898.

The following table gives a comparison of the winds, mean pressure, temperature, rainfall, cloud, and sunshine of 1898 as compared with the previous forty-two years' averages:—

TABLE SHOWING FOR WIND DIRECTION AND FORCE, MEAN BAROMETRIC PRESSURE, MEAN TEMPERATURE, RAINFALL, CLOUD, AND SUNSHINE, THE EXCESS ABOVE, OR THE DEFECT FROM, THE AVERAGES FOR ALL SCOTLAND FOR THE PREVIOUS FORTY-TWO YEARS.

	DIRECTION OF WINDS—DAYS.									Wind Force.	Barometric Pressure.	Temperature.	Rainfall.	Cloud.	Sunshine.
	N.	N.E.	E.	S.E.	S.	S.W.	W.	N.W.	Calms.						
										lb. per sq. ft.	inches.	°	inches	0 to 10.	hours.
Jan. .	-1	-1	-1	-2	-1	3	4	-1	0	0·50	0·298	5·8	-0·76	0·44	-18
Feb. .	1	-1	-2	-3	0	-1	5	2	-1	2·00	-0·136	-0·2	0·84	-0·46	- 7
March .	1	1	-2	-1	0	-2	1	1	1	0·18	0·064	0·2	-0·53	-0·30	- 4
April .	-2	-2	-1	2	2	1	2	-1	-1	0·46	-0·095	1·5	1·47	0·58	-48
May .	1	0	1	-1	-1	-2	1	2	-1	0·25	-0·103	-1·3	0·34	0·22	-12
June .	1	0	-1	0	0	0	-1	0	1	0·00	-0·014	-0·4	-0·16	0·47	-44
July .	1	0	-1	-1	-1	-2	3	2	-1	0·17	0·180	-0·6	-1·65	-0·87	10
August	-1	0	0	0	0	0	2	0	-1	0·25	0·030	0·7	0·73	-0·90	-15
Sept. .	-1	-1	-1	0	1	0	2	-1	1	-0·12	0·132	3·2	0·19	-1·70	- 2
Oct. .	-2	0	4	1	0	-1	-1	-2	1	0·52	-0·002	3·7	0·37	2·00	-14
Nov. .	0	0	0	-1	1	0	0	-1	1	0·18	-0·068	1·1	1·23	0·13	-13
Dec. .	-2	-1	-1	-1	0	2	3	1	-1	1·01	-0·051	4·8	2·10	0·12	-14
Year .	-4	-5	-5	-7	1	-2	21	2	-1	0·45	0·020	-1·5	4·17	0·02	-181

JANUARY.—The mean temperature of the month was 42°·9, or 5°·8 above the average, and this excess was equally distributed between the days and the nights. This is absolutely the highest mean temperature hitherto recorded for January by the Scottish Meteorological Society, the next highest being 41°·2 in 1882, or 1°·7 lower than this month. This was due to the quite extraordinary prevalence of west south-westerly winds, these occurring on 20 days—10 days from the S.W. and 10 days from the W. These in their turn were occasioned by the circumstance that barometric pressure exceeded the average to a much greater extent in the south than in the north of Scotland, the excess above the normal being 0·330 inch on the Solway, but only 0·143 inch in the north of Shetland. Accompanying this was a decidedly greater excess of temperature in the south as compared with the north, the excess being 6°·5 on the Solway, whereas in Shetland it was only 3°·5. The excess of temperature was also from one to two degrees higher at inland than at coast stations. Another striking feature of the temperature was that at fourteen stations it did not fall below freezing on any night during the month.

The mean rainfall was 3·14 inches, or 20 per cent under the average. The rainfall was distributed over Scotland in a very unequal manner. Thus at all stations south of the Grampians it was less than the average, the quantities collected over large areas being only from one-fourth to one-half the average. It was also deficient in the southern Hebrides, and from Wick to Inverness and westward of this line. On the other hand, the average was exceeded in Orkney, along the south shore of the Moray Firth, and the Caledonian Canal from Inverness to Loch Linnhe. The excess was 100 per cent at Deerness and 50 per cent at Fort William.

FEBRUARY.—The mean temperature was 38°·2, being only slightly below the average, but its geographical distribution was unequal. Thus it was under the average to the north of a line drawn from near Skerryvore through Glencarron to Kinnaird Head, and thence at strictly coast stations only as far south as the mouth of the Tweed, over this region the deficiency being about a degree. Over the rest of Scotland temperature was above the average, the greatest excess 1°·5 being in the south-west from Oban to Ayr.

The mean rainfall was 3·90 inches, or 27 per cent above the average Its distribution was peculiar. Over the eastern side of the great watershed of Scotland it was under the average, the greatest deficiency, more than half the average, occurring from the South Esk in Forfarshire to the Tweed. Everywhere else in Scotland, except a few very restricted areas, it was above the average, in many places in the north and west very largely so. The percentages of excess were 175 at Stromness, 152 at Barra Head, more than double the average at Deerness, Thurso, Fearn, Fort Augustus, and Turnberry. At several places the absolute amounts were very large, being 15·22 inches at Glenquoich, and more than 10 inches at Glencarron, Fort William, and Lochbuie; whilst at Ben Nevis Observatory it was 30·09 inches.

MARCH.—The mean temperature was 39°·6, being near the average, the days being 0°·6 above the average, but the nights 0°·2 under it. To the north of a line from Wick to Stornoway, and to the south of a line from Ayr to Berwick, temperature was under the average, very slightly in the north, but nearly a degree in the south. In intermediate districts, which included nearly the whole of Scotland, the temperature was above the average, the excess over large areas being more than a degree.

The rainfall was 2·27 inches, or 19 per cent under the average. It exceeded the average to the north of a line from Ardnamurchan to Kinnaird Head, but fell short of it to the south of the same line, or over that part of Scotland most open to the northerly winds which prevailed. Over the north-west and north, including Orkney, the excess was fully 50 per cent, whereas over wide districts south of the Grampians the rainfall amounted to only a fourth part of the average. Heavy rains occurred at several places in the west on the 16th, 17th, and 18th, and on the last of these days 6·09 inches fell at the Ben Nevis Observatory.

APRIL.—The mean temperature was 45°·6, or 1°·5 greater than the average, the days being 0°·8 and the nights 2°·3 in excess. Thus the high mean temperature was mainly brought about by the high temperature during the night, the mean night temperature being in truth one of the five highest recorded during the past forty-three years. Though the sunshine was 48 hours under the average, yet the unwonted prevalence of winds from south-westerly directions, which prevailed seven days more than the average, resulted in the high temperature of the month. These south-westerly winds were the necessary result of the barometric pressure being relatively very much lower at western as compared with eastern districts. Also temperatures were much higher at western than at eastern stations; thus while in the west it varied from 2°·0 to 3°·0, in the east from the Firth of Forth to Kinnaird and over Shetland it was less than a degree above the average.

The mean rainfall was 3·61 inches, or 68 per cent above the average, and it was distributed over the country with very marked irregularity. It was under the average in restricted districts in Mid-Lothian, Galloway, and in the counties of Ayr, Inverness, and Elgin, the deficiency at Ardwell, Ardrossan, and Inverness being about a third of the average. On the other hand. over the wide district comprised between the lower reaches of the Don and the Tay, the excess may be represented as unprecedentedly great, being in per cents, 308 at Johnstone Lodge, Laurencekirk; 220 at Montrose Asylum, and 200 at Lednathie. This torrential rainfall, limited to the last four days of the month, fell with strong E.S.E. winds. On these days 6·47 inches fell at Johnstone Lodge, while on the other side of the Grampians the fall at Kingussie was all but *nil*.

MAY.—The mean temperature was 47°·7, or 1°·3 less than the average, the deficiency being about equally partitioned between the days and the nights. In the south-west, from Ayr to Monach, the mean temperature was nearly the average, even just exceeding it at Poltalloch, Fladda, and Rhinns of Islay. In northern, eastern, and inland situations, it was upwards of 2°·0 under the average over wide agricultural districts, the greatest deficiency occurring in the counties of Berwick, Roxburgh, Peebles, Elgin, Nairn, and eastern Inverness.

The mean rainfall was 2·62 inches, or 15 per cent above the average. Among the stations its distribution was very irregular, being under the average in the counties of Berwick, Fife, the inland parts of Galloway, Lower Clydesdale, western Perthshire, and the south of Inverness-shire. Elsewhere it was above the average. The greatest amounts, being fully double the average, were at Kirkwall, Deerness, Thurso, Dunrobin, Tarbet Ness, and Perth; while over large breadths bordering the Moray Firth, the Outer Hebrides, and in the counties of Wigtown, Ayr, and south Argyll, the excess amounted to 50 per cent. Comparatively little rain fell from the 6th to the 9th, and from the 18th to the 27th.

JUNE.—The mean temperature was 54°·4, or 0°·4 less than the average, and this small deficiency was equally distributed between the days and the nights. The temperature was from half a degree to fully a degree under the average to the east of a line drawn from Kelso through Dundee to Aberlour, and to the north of a line from this point through Inverness to North Uist. Over other parts of Scotland it exceeded the average, the excess rising at the more strictly inland stations to a degree.

The mean rainfall was 2·32 inches, or 7 per cent less than the average. Its distribution was very irregular, being above the average in Shetland, Orkney, the extreme north of Scotland, the Outer Hebrides, north-west of Argyll, and south-west of Ayrshire. Elsewhere it was under the average. The greatest deficiency, about 50 per cent, was over a wide district, bounded on the west by a line from Dundee through Kingussie to Tain. On the other hand, the greatest excess was in the Outer Hebrides, where at Monach it amounted to 53 per cent. Thunderstorms were more frequent than usual, yet the month was remarkable for an absence of heavy daily falls of rain.

JULY.—The mean temperature was 56°·5, or 0°·6 under the average, the days being 0°·5 above and the nights 1°·8 under it, the relatively higher temperature of the days being due to the greater sunshine, and the lower temperature of the nights to the northerly winds combined with the drier state of the air, by which terrestrial radiation was greater than is usual in July. In the extreme north temperature was about 2°·0, and in the extreme south about 1°·0, under the average; whereas it was nearly half a degree above it over intermediate districts, bounded on the north by a line drawn from Corran to Aberdeen, and on the south by a line from Rothesay to North Berwick.

The mean rainfall was 1·52 inch, being 52 per cent under the average, less than half the usual July rainfall. This is one of the smallest recorded rainfalls for this month, smaller amounts having been observed only in 1863, 1868, and 1878. In Orkney alone it exceeded the average, but only to a small amount. Over all other parts of Scotland it was under the average, the fall being less than a fourth part of the average over wide districts. The deficiency was greater in the southern than the northern half of Scotland.

AUGUST.—The mean temperature was 57°·3, or 0°·7 above the average, the days being 1°·1 and the nights 0°·3 in excess. The greatest excess occurred in south-western districts, and the least in strictly inland situations, and along the east coast from the Tweed to North Unst.

The mean rainfall was 4·36 inches, or 20 per cent above the average. The amount was irregularly distributed, being under the average to the east of a line from Dunrobin through Fort Augustus, Braemar, and Cupar, and in the counties of Berwick, Peebles, and Selkirk. The greatest deficiency, about 30 per cent, occurred at coast stations in the east. Everywhere else the rainfall exceeded the average, and in all districts fairly well open to westerly winds the general excess was from 25 to 50 per cent.

SEPTEMBER.—The mean temperature was 56°·0, or 3°·2 above the average, the days being 4°·2 and the nights 2°·2 in excess. This high temperature has previously been exceeded only in 1857, 1865, 1890, and 1895. It was brought about by the very dry atmosphere, clear skies, and strong sunshine accompanying the anti-cyclones which were so marked a feature in the meteorology of the month. The excess was greatest, from 3°·2 to 4°·2, at inland stations, and at eastern stations from Sutherland to the Cheviots. On the other hand it was only a degree in Shetland, and little more than 2°·0 in the west from Cape Wrath to the Solway. The warmest week was that ending the 10th, when the excess at Marchmont, Braemar, Kingussie, and Lairg was 11°·0, but for the same week it was only 4°·4 at Sumburgh Head. At these inland stations the mean temperature was 16°·0 lower for the last ten days of the month than for the week ending the tenth.

The mean rainfall was 3·73 inches, or 5 per cent above the average. It was under the average in Shetland, to the south-west of Clydesdale, and at eastern stations from the Moray Firth to the Cheviots. At some stations between Aberdeen and the Cheviots the deficiency was from 50 to 70 per cent. Over the rest of the country the rainfall exceeded the average, the excess reaching 75 per cent at Tarbet Ness, Corran, Airds, Inveraray, Dollar, Rhinns of Islay, and Corsewall. The month was free from storms, except for the last three days, when a storm from the south-west occurred on the coasts from Islay to the Solway. During this remarkable month the rainfall on Ben Nevis was 24·81 inches, and the mean temperature was 4° 7 above the average. A fine aurora was seen everywhere on the 9th.

OCTOBER.—The mean temperature was 50 ·1, or 3°·7 above the average. This is the highest mean temperature yet recorded by the Society for any October. The days were 3°·4, and the nights 3°·9 above the average. The excess of temperature was singularly uniform over all parts of the country, except that it was a little higher at inland as compared with coast stations, and in Orkney and Shetland it was less than over the mainland of Scotland, the excess at North Unst being only 2°·0. With the exception of the 12th, 15th to the 18th, 30th and 31st, temperature may be considered as having been phenomenally high for the time of the year.

The mean rainfall was 4·42 inches, or 9 per cent above the average. It was above the average at all stations on the eastern slope of the country from the Don to the Tweed, this being the district of Scotland most freely exposed to the easterly winds. At many places the excess was very large, being, in percentages above the averages, 160 at Haddington, 133 at Smeaton, 122 at Perth and Broomlands near Kelso, and 110 at Tillypronie. It was also above the average, but only slightly, to the west of the Moray Firth from Cromarty northwards and in Shetland. In all other districts in Scotland it was under the average, the greatest deficiency being about 50 per cent in the west from Cape Wrath to Islay. The greater part of the rain fell during the second half of the month, the first fortnight being generally dry. At many eastern stations the rainfall of the 17th and 18th was very heavy, the amounts collected on these two days being, in inches, 3·40 at Perth and Haddington, 3·31 at Marchmont, and 2·87 at Dundee.

NOVEMBER.—The mean temperature was 41°·7, or 1°·1 above the average, the days being 1°·5 and the nights 0°·5 in excess. The excess of temperature was rather greater in the south than in the north, but on the whole it may be regarded as pretty evenly distributed among the stations. During the first three weeks the relatively high temperature of the previous month was continued into November, but during the last ten days of the month temperature was much lower.

The mean rainfall was 5·05 inches, or 32 per cent above the average. This is rather a large mean rainfall for November. In a few scattered districts in the counties of Shetland, Ross, Inverness, Argyll, Aberdeen, and in Galloway, the rainfall was under the average, but the deficiency nowhere scarcely exceeded 30 per cent. Everywhere else it exceeded the average, there being about 90 per cent of excess at Stornoway, Thurso, Cupar, North Esk Reservoir, and Stobo Castle. On the first four days strong winds with very heavy rains prevailed, depositing at a good many places a depth of fully five inches during these days. The rains from the 23rd to the 25th were also very heavy; and from the 21st to the 29th snow was of frequent occurrence.

December.—The mean temperature was 42°·6, or 4°·8 above the average, the days being 5°·3 and the nights 4°·2 in excess. The excess was rather less than a degree in the extreme north of the Hebrides, Orkney, and Shetland; but it gradually increased on advancing southwards, till in inland situations south of the Grampians it exceeded 6°·0. Generally, the excess was greater at east-coast than at west-coast stations. Except on the last two days of the month, high temperatures ruled throughout.

The mean rainfall was 6·07 inches, or 53 per cent above the average. It is scarcely possible to point to a previous month when the amounts collected at the different stations showed differences so extraordinary. To the east of a line from Haddo House passing Perth, Loch Leven, Edinburgh, and Kelso, the rainfall was under the average, the deficiency, being greatest at places near the coast from the Don to the Tweed, being about 50 per cent. It was also, but to a small extent, less than the average over the extreme south-west of Galloway. In every other part of Scotland it was above the average, rising to more than double over very extensive breadths. The heaviest rainfalls were at places north of the Grampians, the largest, stated in percentages above their averages, being 219 at Glencarron, 212 at Kingussie, 203 at Stornoway, 185 at Cromarty, and 178 at Fort William. The largest absolute rainfalls were, in inches, 23·20 at Fort

William, and 21·65 at Glencarron; and the smallest, 1·03 at Haddington, and 1·17 at Arbroath. Falls of more than an inch a-day were of frequent occurrence during the month. Widespread storms of winds occurred on 16 days.

The harvest of 1898 began about the average time, but from a week to a fortnight earlier than in 1897. As the weather continued fine and dry till near the end of September, the crops, except in late districts, were secured in exceptionally fine condition.

Wheat was nearly everywhere above the average, and *barley* was either up to the average or above it A similar remark applies, except in one or two districts, to *oats.*

Potatoes were, over large breadths, double an average crop, and everywhere exceeding the average, except to the north and west of the Caledonian Canal. In Skye, Orkney, and in [illegible] parts of Berwickshire only about half the average crop was secured.

Turnips were in nearly all districts less than the average, the crop being less than half the average in some places. In a few districts between the Tweed and the Tay a full average was obtained

AGRICULTURAL STATISTICS.—RETURNED UPON 4TH JUNE 1898.—(*Compiled from the Government Returns.*)

TABLE NO. 1.—ACREAGE UNDER EACH KIND OF CROP, BARE FALLOW, AND GRASS, IN EACH COUNTY OF SCOTLAND.

COUNTIES.	Total Acreage under Crops, Bare Fallow, and Grass.	CORN CROPS							GREEN CROPS.							Clover, Sainfoin, and Grasses under Rotation.	Permanent Pasture (exclusive of Mountain Land).	Flax.	Small Fruit.	Bare Fallow or Uncropped Arable Land.
		Wheat.	Barley or Bere.	Oats.	Rye.	Beans.	Peas.	Total.	Potatoes.	Turnips.	Mangels.	Cabbage, Kohl-rabi, and Rape	Vetches or Tares.	Other Green Crops.	Total.					
	Acres	Acres	Acres.	Acres.	Acres	Acres	Acres	Acres.	Acres.	Acres.	Acres	Acres	Acres	Acres	Acres.	Acres	Acres.	Acres.	Acres.	Acres.
1. Aberdeen . .	629,886	35	32,928	181,546	286	460	333	215,588	7,322	89,818	44	100	2,279	264	99,827	281,722	32,102	..	358	289
2. Argyll . .	133,854	..	1,578	17,847	846	110	16	20,397	4,759	5,627	23	215	16	23	10,663	27,539	74,732	..	45	478
3. Ayr . . .	320,535	1,992	1,401	44,851	197	662	55	49,158	7,297	7,061	466	872	33	321	16,050	104,144	150,913	..	148	122
4. Banff . . .	160,149	7	11,725	45,714	68	140	54	57,708	1,969	22,093	2	3	952	9	25,028	65,521	11,775	2	12	103
5. Berwick . .	190,202	3,214	19,632	33,441	44	1,067	41	57,459	2,413	27,294	186	496	773	17	31,179	59,233	42,249	..	23	59
6. Bute . . .	25,711	25	141	4,972	103	48	12	5,301	961	1,460	12	72	2	14	2,521	8,841	8,734	..	84	280
7. Caithness . .	112,115		1,105	34,138	129	4	33	35,409	1,633	13,566	1	41	437	20	15,698	32,243	28,457	..	3	305
8. Clackmannan .	15,653	355	428	3,064	2	488	..	4,337	327	795	1	15	24	4	1,166	3,682	6,278	..	18	172
9. Dumbarton .	51,618	1,123	210	6,896	15	174	8	8,426	2,308	1,503	27	275	43	16	4,172	15,569	23,811	..	65	75
10. Dumfries . .	259,046	137	783	43,937	27	30	7	44,921	3,523	18,949	112	1,076	34	79	23,773	82,814	107,289	..	58	191
11. Edinburgh . .	134,192	5,053	4,739	23,241	13	87	136	33,269	5,125	11,774	24	910	304	402	18,539	32,238	49,833	..	288	30
12. Elgin . . .	101,638	1,315	15,194	19,645	676	83	12	36,925	1,709	15,621	9	7	420	10	17,776	38,068	8,796	1	21	51
13. Fife . . .	255,986	10,450	21,341	39,044	1,145	1,255	43	73,278	14,264	24,749	23	427	714	60	40,237	68,604	73,111	..	166	590
14. Forfar . .	251,554	8,439	29,549	47,836	919	704	89	87,536	11,965	33,970	77	264	536	90	46,902	85,613	31,188	..	210	105
15. Haddington .	112,025	6,349	14,714	17,403	13	598	95	39,172	7,686	15,887	105	439	173	269	24,559	27,627	20,249	..	389	29
16. Inverness . .	149,791	60	7,695	29,850	721	5	30	38,361	5,927	10,592	9	46	128	28	16,730	30,653	63,831	..	30	186
17. Kincardine	120,789	526	13,925	27,703	90	650	39	42,933	2,372	17,846	3	12	421	74	20,728	48,218	8,817	..	81	12
18. Kinross . .	35,294	34	421	6,366	48	49		6,918	588	2,705	.	173	43	1	3,510	12,074	12,750	..	18	24
19. Kirkcudbright .	191,586	107	78	27,536	20	17	5	27,763	1,481	12,854	40	1,563	49	36	16,023	62,767	84,983	..	21	29
20. Lanark . .	256,365	2,567	350	37,691	37	733	28	41,406	4,163	9,726	45	1,964	284	248	16,430	104,408	91,764	..	1,981	376
21. Linlithgow .	58,774	1,527	3,035	9,740	8	341	3	14,654	1,636	3,885	4	180	197	4	5,906	15,501	22,538	..	27	148
22. Nairn . . .	25,676	27	3,607	5,315	71		2	9,022	324	4,182	10	1	28	3	4,548	9,764	2,269	..	3	70
23. Orkney . .	[illegible]695	..	4,711	33,479	..	5	38	38,233	2,775	14,485	1	36	311	5	17,613	33,869	16,705	..	..	275
24. Shetland . .	[illegible]60	..	1,982	7,387	..	..	..	9,369	3,121	1,305	.	490	4	..	4,920	1,334	43,701	..	..	436
25. Peebles . .	[illegible]086	13	381	8,174	3	..	16	8,587	369	4,081	2	370	71	3	4,896	17,400	17,183	..	10	10
26. Perth . . .	[illegible]939	6,096	14,672	63,985	545	2,125	78	87,501	12,385	29,040	24	352	350	117	42,268	100,010	106,077	..	880	1,203
27. Renfrew . .	92,447	1,879	131	11,330	25	252	29	13,646	2,946	2,325	30	458	34	57	5,850	26,768	45,985	..	103	95
28. Ross & Cromarty	141,191	1,090	13,200	29,510	703	24	86	44,563	7,523	16,146	14	18	464	21	24,186	43,427	28,840	..	25	150
29. Roxburgh . .	179,692	779	12,379	29,540	15	167	31	42,911	1,295	21,782	19	665	823	20	24,104	54,359	58,245	..	47	26
30. Selkirk . .	30,062	7	460	5,050	4		11	5,552	188	2,824	.	112	34	6	3,164	8,770	12,537	..	38	1
31. Stirling . .	118,616	2,109	3,093	18,296	11	2,919	21	26,449	2,989	4,510	12	252	265	45	8,073	31,302	51,609	..	104	1,079
32. Sutherland .	32,303		1,476	7,887	90	5	16	9,474	1,677	3,035	..	27	37	3	4,779	8,833	9,106	..	3	108
33. Wigtown . .	153,587	560	886	33,519	35	190	8	35,198	1,342	15,789	130	420	66	78	17,825	65,018	35,257	..	17	222
Total . .	4,892,767	55,875	237,970	955,933	6,909	13,412	1,325	1,271,424	126,362	467,279	1,455	12,351	9,849	2,347	619,643	1,607,933	1,381,214	3	5,271	7,279

TABLE [illegible].—[illegible]TED TOTAL PRODUCE OF WHEAT, BARLEY, AND OATS, ACREAGE and Estimated AVERAGE YIELD per Acre in the Year 1897, compared with the Estimated YIELD for the Years 1896 and 1895, and the AVERAGE of the Ten Years, 1887-96, in each COUNTY of SCOTLAND.

COUNTIES.	WHEAT.						BARLEY, INCLUDING BERE.						OATS.					
	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre. 1897.	1896.	1895.	Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre. 1897.	1896.	1895.	Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre. 1897.	1896.	1895.	Average of the Ten Years, 1887-96.
	Bush	Acres	Bush	Bush	Bush.	Bush	Bush.	Acres.	Bush	Bush	Bush.	Bush.	Bush.	Acres.	Bush.	Bush.	Bush.	Bush.
Aberdeen	160	5	32.00	38.91	26.00	28.96	1,110,252	29,353	37.82	35.76	34.13	33.43	6,544,697	184,482	35.48	36.44	36.04	34.62
Argyll	..	.	.	.	..	32.00	51,500	1,685	30.56	34.42	34.39	31.42	533,135	17,951	29.70	30.80	30.21	31.02
Ayr	71,629	1,928	37.15	35.16	32.87	37.66	52,289	1,402	37.30	41.47	35.23	38.88	1,959,107	45,554	43.01	46.10	41.27	45.48
Banff	345	12	28.75	32.00	32.00	30.61	415,035	10,965	37.85	37.06	36.27	34.70	1,632,936	45,980	35.51	35.88	36.68	34.27
Berwick	74,509	2,206	33.78	35.75	29.62	32.83	734,806	20,065	36.62	36.70	33.82	35.40	1,345,349	34,286	39.24	35.68	35.64	37.66
Bute	696	18	38.67	24.00	..	26.00	3,676	90	40.84	43.46	38.53	39.40	196,665	5,239	37.54	35.84	32.19	36.38
Caithness	76	5	15.20	12.00	14.60	17.07	22,126	1,010	21.91	27.47	33.33	33.09	909,501	33,840	26.88	29.13	36.48	33.01
Clackmannan	15,697	366	42.89	39.39	31.67	35.46	13,789	359	38.41	42.27	32.96	35.06	149,879	3,298	45.45	45.37	39.48	41.85
Dumbarton	39,482	1,032	38.26	40.37	37.66	39.23	9,385	223	42.09	44.24	42.10	40.38	281,004	7,047	39.88	43.77	44.33	41.11
Dumfries	4,714	130	36.26	42.00	30.56	34.68	22,117	630	35.11	35.59	27.91	33.25	1,519,778	44,526	34.13	34.74	28.89	33.19
Edinburgh	195,897	4,498	43.55	44.49	40.31	42.20	214,451	5,040	42.55	44.53	42.82	43.20	1,002,160	23,457	42.72	43.71	42.67	42.47
Elgin or Moray	33,721	831	40.58	37.64	34.85	33.43	552,110	14,896	37.06	36.13	36.78	33.52	728,984	19,993	36.46	36.62	39.58	34.71
Fife	339,813	9,860	34.46	37.23	30.31	33.70	762,662	21,863	34.88	36.55	32.13	34.27	1,683,418	39,585	42.53	42.58	32.28	36.97
Forfar	301,460	7,938	37.98	37.39	31.57	33.66	1,077,706	29,413	36.64	37.54	33.60	36.65	2,170,377	48,981	44.31	43.19	42.03	43.62
Haddington	223,400	5,773	38.70	38.75	34.99	37.47	610,047	14,926	40.87	42.86	38.55	41.40	791,352	18,237	43.39	45.15	42.00	44.91
Inverness	923	30	30.77	35.62	33.50	34.65	222,445	7,333	30.33	34.74	36.46	34.68	933,608	30,266	30.85	34.29	32.96	30.89
Kincardine	17,259	[illegible]	[illegible].78	35.54	32.70	34.68	500,799	13,070	38.32	38.52	35.33	34.82	1,154,548	28,637	40.32	41.99	39.68	38.71
Kinross	456	[illegible]	[illegible].00	..	..	29.68	15,240	435	35.03	34.02	29.09	35.76	181,200	6,242	29.03	29.06	26.26	33.88
Kirkcudbright	3,170	95	[illegible]	30.68	30.60	30.29	2,223	62	35.85	30.31	30.39	31.17	958,553	27,543	34.80	32.92	29.26	33.33
[illegible]	75,428	2,260	33.[illegible]	36.04	32.15	36.77	11,632	377	30.85	32.53	30.94	36.14	1,318,882	37,987	34.72	35.33	32.31	35.60
[illegible]w	57,218	1,392	41.10	[illegible].94	35.28	37.71	135,734	3,172	42.79	43.99	42.32	42.85	433,987	9,766	44.44	45.92	43.54	42.72
[illegible]	444	12	37.00	[illegible]	24.75	29.41	131,320	3,609	36.39	34.16	35.77	33.63	197,068	5,530	35.64	36.18	31.28	34.39
[illegible]	..	..	..	..	..	.	153,001	4,616	33.15	33.84	33.70	32.03	938,868	33,445	28.07	29.84	29.61	27.99
Peebles	360	13	27.69	32.00	28.00	30.80	9,911	315	31.46	34.42	31.30	33.66	250,007	8,071	30.98	34.67	31.33	34.14
Perth	219,715	5,404	40.66	40.19	30.54	35.31	521,545	14,380	36.27	34.17	30.57	33.61	2,432,019	65,079	37.37	35.18	31.89	34.16
Renfrew	67,338	1,788	37.60	42.01	39.37	41.23	5,417	135	40.13	42.12	37.84	42.87	491,524	11,688	42.05	42.61	41.74	43.96
Ross and Cromarty	26,357	694	37.98	43.00	44.89	39.33	479,826	12,977	36.98	40.79	41.93	37.70	1,104,714	29,864	36.99	42.32	43.28	38.33
Roxburgh	16,997	510	33.33	33.41	27.75	32.97	439,347	12,667	34.68	34.93	33.47	35.34	1,080,729	29,288	36.90	33.52	32.43	35.12
Selkirk	150	5	30.00	..	24.00	25.60	12,659	367	34.49	28.93	27.36	30.99	181,352	4,914	36.91	34.77	31.95	32.30
Shetland	..	..	..	..			54,002	2,002	26.97	22.79	26.84	23.65	227,410	7,312	31.11	24.25	29.66	21.42
Stirling	81,961	2,013	40.42	35.22	27.17	33.37	120,593	3,319	36.33	39.52	35.41	35.25	765,644	18,423	41.56	40.97	38.25	38.08
Sutherland	..		..	..	25.00	25.42	38,314	1,365	28.07	33.02	34.16	32.18	209,630	7,920	26.47	31.17	33.12	33.02
Wigtown	14,613	[illegible]	28.43	29.60	24.92	28.52	32,956	975	33.80	33.31	28.20	30.95	1,134,139	34,048	33.31	33.64	31.05	36.50
Total	1,893,388	49,782	37.83	38.47	32.83	35.64	8,538,915	233,096	36.63	37.14	34.92	35.51	35,442,224	968,474	36.60	37.13	35.55	36.12

TABLE No. 3.—ESTIMATED TOTAL PRODUCE OF BEANS, PEAS, AND POTATOES, ACREAGE and Estimated AVERAGE YIELD per Acre in the Year 1897, compared with the Estimated YIELD for the Years 1896 and 1895, and the AVERAGE of the Ten Years, 1887-96, in each COUNTY of SCOTLAND.

Counties.	Beans.						Peas.						Potatoes.					
	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre			Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre			Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre.			Average of the Ten Years, 1887-96.
			1897.	1896.	1895.				1897.	1896.	1895.				1897.	1896	1895.	
	Bush.	Acres.	Bush	Bush.	Bush.	Bush	Bush.	Acres.	Bush.	Bush.	Bush.	Bush.	Tons.	Acres.	Tons.	Tons.	Tons.	Tons.
Aberdeen	11,772	463	25.43	24.40	24.89	24.34	8,059	371	21.72	23.39	23.99	22.08	33,236	7,073	4.70	4.93	5.72	5.11
Argyll	2,291	124	18.48	15.29	18.66	20.60	231	13	17.77	19.00	20.50	21.08	18,179	4,727	3.85	4.37	6.46	5.14
Ayr	21,299	616	34.58	34.17	31.70	32.49	602	17	35.41	34.50	31.37	34.31	33,816	7,158	4.72	7.10	5.73	6.45
Banff	3,378	127	26.60	26.62	23.95	25.44	1,023	45	22.73	21.60	23.07	22.02	9,524	1,958	4.86	6.20	5.70	5.14
Berwick	31,148	956	32.58	34.32	28.34	30.74	2,571	89	28.89	31.97	24.67	24.54	13,816	2,271	6.08	8.40	7.69	6.07
Bute	1,089	46	23.67	15.56	18.23	22.84	314	17	18.47	21.37	14.00	19.51	3,895	949	4.10	5.81	7.82	6.52
Caithness	18	2	9.00	6.00	9.00	12.31	476	32	14.87	8.74	9.33	14.39	7,025	1,623	4.33	2.48	7.62	4.69
Clackmannan	16,267	480	33.89	35.95	30.63	29.97	476	14	34.00	..	..	26.44	2,361	266	8.88	9.87	7.06	7.72
Dumbarton	4,280	188	22.77	27.31	23.34	27.81	179	11	16.27	21.16	16.33	20.52	9,707	2,149	4.52	9.10	4.37	7.87
Dumfries	945	33	28.64	29.71	22.68	26.78	109	5	21.80	26.00	21.00	24.07	12,896	3,391	3.80	7.13	8.36	6.38
Edinburgh	5,249	162	32.40	35.26	34.53	32.39	3,846	148	25.99	27.42	25.14	24.41	26,653	4,542	5.87	7.79	6.75	6.73
Elgin or Moray	2,146	65	33.02	28.68	26.85	27.01	767	26	29.50	21.32	23.70	21.69	7,741	1,641	4.72	5.70	5.93	4.66
Fife	46,963	1,392	33.74	34.82	24.29	32.73	658	24	27.42	32.39	20.22	28.38	46,655	13,326	3.50	6.00	6.51	5.07
Forfar	24,187	765	31.62	33.05	29.51	31.42	3,216	115	27.97	29.62	29.24	26.95	46,245	11,429	4.05	6.96	11.66	5.61
Haddington	20,965	625	33.54	38.24	35.62	32.90	2,541	99	25.67	29.24	26.65	24.96	38,456	7,205	5.34	8.22	9.08	6.75
Inverness	53	3	17.67	22.75	..	21.04	379	17	22.29	25.68	25.64	26.44	22,858	5,744	3.98	3.50	6.67	4.41
Kincardine	26,006	683	38.08	37.80	34.53	32.79	864	34	25.11	30.05	25.61	25.64	10,878	2,190	4.97	5.80	7.05	6.10
Kinross	1,792	51	35.14	36.00	30.00	30.93	32	1	32.00	..	24.00	28.00	2,295	517	4.44	6.81	6.82	5.70
Kirkcudbright	2,073	64	32.39	31.04	29.22	33.04	81	3	27.00	23.00	28.00	27.83	5,048	1,436	3.52	5.66	6.82	5.88
Lanark	23,601	784	30.10	31.88	31.99	32.29	1,345	52	25.87	32.68	31.77	28.29	18,810	3,573	5.26	8.20	7.89	6.88
Linlithgow	11,502	373	30.84	35.16	28.55	31.40	237	10	23.70	26.40	24.83	24.95	8,318	1,411	5.90	7.67	6.69	6.40
Nairn	24	1	24.00	..	..	24.00	133	6	22.17	24.65	24.64	21.23	1,181	327	3.61	5.60	5.59	4.55
Orkney	—	—*	—	—	—	10.33	—	—†	—	—	—	11.27	21,651	2,749	7.88	5.08	3.34	6.52
Peebles	..	..	..	..	..	26.36	708	30	23.60	24.93	25.00	23.28	1,774	335	5.30	7.64	6.10	6.49
Perth	84,516	2,304	36.68	33.24	30.13	30.09	2,419	77	31.42	28.41	25.06	25.67	51,611	11,416	4.52	6.90	7.18	6.16
Renfrew	10,383	271	38.31	39.82	40.33	40.57	1,096	32	34.25	40.40	35.67	37.42	13,022	2,951	4.41	7.38	6.16	7.06
Ross and Cromarty	247	13	19.00	23.58	23.62	24.86	958	47	20.38	24.38	23.35	25.32	27,754	7,343	3.78	3.86	4.35	4.99
Roxburgh	5,779	199	29.04	32.07	30.39	30.16	924	38	24.32	31.36	26.48	26.55	5,839	1,249	4.67	6.77	3.82	5.63
Selkirk	360	12	30.00	30.00	..	30.00	318	11	28.91	28.00	24.75	24.13	758	203	3.73	5.69	7.33	4.64
Shetland	..	..	..	..	—	..	..	..	..	..	..	..	13,668	3,136	4.36	3.30	4.28	4.18
Stirling	85,670	2,927	29.27	32.78	27.63	28.59	1,005	34	29.56	26.18	27.06	24.87	18,829	2,696	6.98	8.40	8.78	6.91
Sutherland	53	3	17.67	22.00	..	21.29	490	28	17.50	21.27	22.00	20.61	6,274	1,628	3.85	3.28	3.46	4.26
Wigtown	5,202	178	29.22	29.98	29.75	29.02	203	7	29.00	27.17	27.83	29.73	5,065	1,328	3.81	3.72	5.08	4.90
Total	419,258	13,910*	32.30	33.33	29.19	30.67	36,260	1,453†	24.96	25.97	24.74	23.89	545,838	119,940	4.55	6.20	6.80	5.76

* Exclusive of 3 acres in Orkney, the produce of which was picked green.

† Exclusive of 48 acres in Orkney, the produce of which was picked green.

TABLE No. 4.—ESTIMATED TOTAL PRODUCE of TURNIPS (including SWEDES) and MANGELS, ACREAGE and Estimated AVERAGE YIELD per Acre in the Year 1897, compared with the Estimated YIELD for the Years 1896 and 1895, and the AVERAGE of the Ten Years, 1887-96, in each COUNTY of SCOTLAND.

COUNTIES.	TURNIPS.						MANGELS.					
	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre.			Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.	Average Yield per Acre.			Average of the Ten Years, 1887-96.
			1897.	1896.	1895.				1897.	1896.	1895.	
	Tons.	Acres.	Tons.	Tons.	Tons.	Tons.	Tons.	Acres.	Tons.	Tons.	Tons.	Tons.
Aberdeen	1,473,280	90,791	16.23	15.69	14.98	14 78	183	15	12.20	9.67	9.56	10.51
Argyll	69,247	5,818	11.90	13.34	13.90	13.98	202	24	8.42	8.68	10.58	12.08
Ayr	123,097	7,729	15.93	20.20	16.43	17.53	7,254	473	15.34	19.38	20.11	17.58
Banff	361,190	22,242	16.24	17.03	16.55	14.72	245	17	14.41	15.20	12.00	15.09
Berwick	454,900	27,405	16.60	18.40	14.22	16.22	2,690	143	18.81	22.23	18.06	18.27
Bute	24,477	1,503	16.29	15.92	16.88	17.01	72	7	10.29	12.00	12.90	14.07
Caithness	229,742	13,746	16.71	10.10	15.98	14.64	58	6	9.67	8.50	10.00	9.72
Clackmannan	11,010	868	12.68	13.47	10.17	12.12	22	2	11.00	11.00	9.00	12.14
Dumbarton	27,895	1,530	18.23	19.57	18.04	16.83	449	29	15.48	17.10	17.00	15.39
Dumfries	293,345	19,621	14.95	20.13	12.51	15.51	2,116	103	20.54	27.16	17.88	21.96
Edinburgh	241,042	12,416	19.41	19.32	19.43	17.86	650	41	15.85	17.80	16.68	14.36
Elgin or Moray	257,448	15,688	16.41	17.22	19.06	16.11	104	7	14.86	18.92	15.00	16.61
Fife	369.877	25,256	14.65	14.37	9.45	11.83	444	39	11.38	11.85	6.60	10.04
Forfar	555,874	34,388	16.16	17.00	17.15	16.36	620	28	22.14	22.05	22.83	19.88
Haddington	293,794	16,080	18.27	20.18	19.21	18.72	1,454	92	15.80	20.71	17.51	14.55
Inverness	127,220	10,723	11.86	11.81	11.39	12.29	299	23	13.00	14.00	13.45	18.08
Kincardine	274,003	18,054	15.18	16.01	16.20	14.75	..	..	..	15.00	..	15.66
Kinross	38,762	2,849	13.61	16.71	12.63	12.78	..	..	..	..	..	..
Kirkcudbright	226,742	13,224	17.15	21.22	15.05	16.79	583	31	18.81	20.89	13.29	15.25
Lanark	187,830	10,068	18.66	20.09	20.74	18.91	293	28	10.46	15.79	12.80	13.27
Linlithgow	69,597	4,147	16.78	18.50	17.77	16.72	57	4	14.25	15.57	12.00	11.70
Nairn	63,219	4,209	15.02	15.24	15.34	13.97	18	1	18.00	19.56	12.00	14.39
Orkney	144,570	14,480	9.98	7.05	8.51	10.33	—*	1	—*	..	..	4.08
Peebles	68,760	4,241	16.21	18.01	17.43	16.65	..	..	..	..	..	14.00
Perth	486,315	29,915	16.26	14.16	15.20	14.31	394	39	10.10	8.44	10.38	12.01
Renfrew	36,557	2,411	15 16	18.66	16.92	16.97	472	35	13.49	17.55	16.28	15.61
Ross and Cromarty	184,931	16,449	11.24	10.89	10.78	11.90	245	19	12.89	13.20	13.80	19.92
Roxburgh	319,963	21,458	14.91	18.18	13.51	16.29	316	15	21.07	22.23	18.50	21.20
Selkirk	40,991	2,833	14.47	15.86	11.46	14.14	..	..	..	..	.	21.67
Shetland	22,912	1,318	17.38	11.57	14.58	13.42	..	..	..	—*	2.67	1.33
Stirling	69,348	4,643	14.94	15.79	13.85	15.24	153	11	13.91	14.64	12.56	12.88
Sutherland	32,543	3,180	10.23	9.52	9.78	11.66	..	..	..	..	..	20.50
Wigtown	251,407	15,849	15.86	16.26	12.86	14.17	2,646	141	18.77	19.12	15.24	15.76
Total	7,431,888	475,132	15.64	16.09	14.80	15.01	22,039	1,374	16.04	19.16	17.29	16.73

* Crop failed

TABLE No. 5.—ESTIMATED TOTAL PRODUCE OF HAY from Clover, Sainfoin, and Grasses under Rotation, also Total from Permanent Pasture, ACREAGE, and Estimated AVERAGE YIELD per Acre in the Year 1897, compared with the Estimated YIELD for the Years 1896 and 1895, and the AVERAGE of the Ten Years, 1887-96, in each COUNTY of SCOTLAND.

COUNTIES.	FROM CLOVER, SAINFOIN, AND GRASSES.						FROM PERMANENT PASTURE.					
	Total Produce in 1897	Acreage in 1897.	Average Yield per Acre			Average of the Ten Years, 1887-96.	Total Produce in 1897.	Acreage in 1897.*	Average Yield per Acre.			Average of the Ten Years, 1887-96.
			1897.	1896.	1895.				1897.	1896.	1895.	
	Cwt.	Acres.	Cwt	Cwt.	Cwt.	Cwt.	Cwt.	Acres.	Cwt.	Cwt.	Cwt.	Cwt.
Aberdeen	1,225,688	44,786	27.37	24.04	20.52	26.17	31,763	1,443	22.01	20.91	19.52	20.99
Argyll	322,866	11,312	28.54	31.11	24.56	29.09	350,199	12,721	27.53	31.59	27.11	28.72
Ayr	1.087,650	29,903	36.37	35.41	21.38	33.29	637,842	17,715	36.01	37.58	24.11	36.26
Banff	209,052	9,139	22.87	30.83	19.78	27.43	22,628	1,209	18.72	22.94	17.68	21.37
Berwick	281,[illegible]81	9,091	31.01	30.09	25.62	34.06	52,871	2,281	23.18	23.60	21.97	28.77
Bute	75,419	2,161	34.90	37.46	21.31	34.31	11,286	364	31.01	30.90	21.58	29.01
Caithness	116,952	8,766	13.34	19.05	21.58	26.89	7,817	1,416	5.52	6.65	14.90	17.45
Clackmannan	64,347	1,623	39.65	38.78	24.16	34.28	15,068	519	29.03	27.37	21.99	29.15
Dumbarton	266.193	6,728	39.56	40.78	33.07	34.95	83,398	1,906	43.76	44.49	38.85	34.92
Dumfries	542,228	18,275	29.67	27.70	17.46	24.85	647,092	18,175	35.60	32.11	14.70	26.91
Edinburgh	790,526	13,084	60.42	59.47	52.64	45.65	68,369	2,029	33.70	35.19	34.37	33.66
Elgin or Moray	136,204	5,680	23.98	26.01	23.53	24.60	27,300	1,278	21.36	20.21	20.62	20.01
Fife	879,056	27,999	31.40	32.77	22.47	30.60	131,757	4,856	27.13	24.16	21.39	26.31
Forfar	780,658	20,088	38.86	40.15	38.96	32.81	41,036	1,952	21.02	23.30	25.17	26.41
Haddington	603.660	10,766	56.07	57.82	51.64	44.06	25,649	871	29.45	31.63	31.27	32.35
Inverness	199,780	11,196	17.84	22.38	20.69	18.82	57,565	5,120	11.24	12.28	13.82	12.37
Kincardine	353,795	12,475	28.36	29.67	22.81	27.58	2,230	111	20.09	19.91	15.34	18.97
Kinross	72,758	2,665	27.30	25.34	21.47	27.81	25,528	759	33.63	38.13	24.99	31.42
Kirkcudbright	267,103	8,983	29.73	25.05	19.71	26.12	300,399	12,134	24.76	24.38	20.53	25.41
Lanark	1,287,274	34,641	37.16	41.53	26.16	36.06	330,463	8,976	36.82	40.12	25.62	37.91
Linlithgow	364,529	7,066	51.59	55.82	44.45	40.21	27,922	952	29.33	31.57	30.68	31.50
Nairn	23,114	1,546	14.95	26.76	17.67	20.01	2,880	252	11.43	21.67	16.31	16.82
Orkney	113,870	7,388	15.41	26.53	24.16	21.73	5,190	538†	9.65	11.38	11.26	10.28
Peebles	65,538	2,146	30.54	33.95	21.13	29.59	41,487	1,727	4.02	30.86	22.69	28.19
Perth	792.982	30,637	25.88	35.34	29.61	32.27	226,809	9,347	24.27	24.63	23.39	24.78
Renfrew	574,790	14,116	40.72	42.44	29.08	37.67	228,332	5,048	45.23	50.07	38.18	43.82
Ross and Cromarty	259,359	13,792	18.81	21.23	21.69	21.10	15,295	1,949	7.85	9.67	9.81	10.86
Roxburgh	301,706	9,044	33.36	32.09	24.57	33.50	215,042	8,145	26.40	27.58	20.37	29.34
Selkirk	31,072	1,036	29.99	24.98	20.47	30.37	26,364	1,146	23.01	20.31	15.23	26.07
Shetland	14,223	694	20.49	21.26	23.00	27.81	25,916	1,475	17.57	16.46	17.09	15.32
Stirling	451,223	12,076	37.37	35.85	24.29	31.31	115,205	3,416	33.73	33.21	27.19	28.24
Sutherland	69,136	4,131	16.74	19.23	20.62	19.43	8,417	1,109	7.59	9.17	11.07	12.01
Wigtown	134,135	4,069	32.97	33.88	29.48	38.15	69,663	3,558	19.58	19.89	17.06	27.75
Total	12,758,767	397,102	32.13	33.44	26.00	30.64	3,878,782	134,497†	28.84	29.23	22.61	28.31

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* Exclusive of mountain and heath land.

† This Acreage is less than that stated in some other Tables by 548 acres, which were originally returned for the county of Orkney as "Grass for Hay," but were subsequently stated to have been used for grazing.

TABLE NO. 6.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS IN EACH COUNTY OF SCOTLAND AS RETURNED ON JUNE 4, 1898.

COUNTIES.	HORSES (including Ponies).				CATTLE.				SHEEP			PIGS.
	Used solely for Agriculture, &c *	Unbroken Horses.		Total.	Cows and Heifers in Milk or in Calf.	Other Cattle.		Total.	1 Year Old and above.	Under 1 Year.	Total.	
		1 Year and above	Under 1 Year.			2 Years and above.	Under 2 Years.					
1. Aberdeen	23,333	5,584	1,835	30,752	45,808	45,774	91,630	183,212	135,233	88,257	223,490	11,417
2. Argyll	4,694	1,492	480	6,666	23,071	13,103	27,089	63,263	688,509	331,219	1,019,728	4,147
3. Ayr	7,277	1,637	415	9,329	51,324	13,552	36,841	101,717	234,392	150,944	385,336	12,498
4. Banff	6,684	1,694	535	8,913	13,108	7,067	25,338	45,513	39,327	28,147	67,474	2,713
5. Berwick	4,465	803	196	5,464	3,072	5,729	9,290	18,091	169,694	151,893	321,587	3,682
6. Bute	1,038	186	59	1,283	3,775	1,611	4,442	9,828	31,958	17,103	49,061	713
7. Caithness	4,483	950	334	5,767	7.843	2,740	11,742	22,325	76,767	46,203	122,970	1,424
8. Clackmannan	508	129	41	678	1,532	1,054	1,538	4,124	9,170	5,502	14,672	1,901
9. Dumbarton	1,496	272	88	1,856	8,555	2,489	4,267	15,311	50,618	27,672	78,290	1,589
10. Dumfries	5,809	1,272	420	7,501	20,272	11,575	28,535	60,382	346,979	220,004	566,983	9,794
11. Edinburgh	3,954	559	143	4,656	12,340	4,226	4,933	21,499	112,368	78,828	191,196	7,792
12. Elgin	3,897	848	308	5,053	6,997	4,065	12,836	23,898	42,224	28,320	70,544	2,534
13. Fife	7,738	1,807	382	9,927	12,567	18,416	21,765	52,748	72,680	48,897	121,577	5,047
14. Forfar	8,438	1,271	406	10,115	12,624	21,968	21,552	56,144	102,104	62,916	165,020	6,246
15. Haddington	3,312	268	62	3,642	2,161	6,172	3,197	11,530	77,664	53,916	131,580	1,756
16. Inverness	7,102	1,362	676	9,140	22,240	6,949	24,125	53,314	439,528	205,139	644,667	2,567
17. Kincardine	4,148	642	240	5,030	6,970	7,177	13,789	27,936	26,651	17,254	43,905	2,450
18. Kinross	790	281	61	1,132	1,287	1,190	4,415	6,892	23,675	15,827	39,502	523
19. Kirkcudbright	4,092	1,216	351	5,659	16,187	12,543	20,445	49,175	257,938	147,788	405,726	7,745
20. Lanark	6,556	1,430	385	8,371	40,269	11,393	23,656	75,318	156,387	92,431	248,818	8,025
21. Linlithgow	1,673	412	145	2,230	4,884	3,309	4,676	12,869	18,953	8,154	27,107	1,961
22. Nairn	1,014	299	76	1,389	1,925	827	3,719	6,471	13,962	5,434	19,396	670
23. Orkney	5,257	1,127	501	6,885	9,976	3,336	15,349	28,661	18,994	18,545	37,539	2,637
24. Shetland	3.030	1,676	1,006	5,712	7,863	4,786	6,568	19,219	59,268	38,882	98,150	2,895
25. Peebles	910	161	42	1,113	2,149	1,659	3,583	7,391	112,175	83,677	195,852	643
26. Perth	10,246	2,272	591	13,109	18,771	20,904	38,990	78,665	491,345	249,807	741,152	7,325
27. Renfrew	2.711	526	146	3,383	17,463	2,650	6,566	26,779	25,396	16,810	42,206	1,401
28. Ross and Cromarty	6,266	1,543	492	8,301	18,102	7,974	18,910	44,986	214,244	108,756	323,000	5,001
29. Roxburgh	3,740	425	120	4.285	4,582	5,150	8,368	18,100	296,320	240,834	537,154	3,364
30. Selkirk	618	72	32	722	1,257	468	1,703	3,428	104,622	82,486	187,108	438
31. Stirling	3,627	924	269	4,820	12,091	9,109	13,723	34,923	79,451	49,212	128,663	2,242
32. Sutherland	2,283	342	126	2,751	5,769	2,000	4,950	12,719	142,473	64,602	207,075	880
33. Wigtown	4,281	1,279	387	5,947	23,509	7,853	18,491	49,853	83,253	48,167	131,420	10,146
Total	155,470	34,761	11,350	201,581	440,343	268,820	537,021	1,246,284	4,754,322	2,833,626	7,587,948	134,116

* Including Mares kept for breeding.

TABLE NO. 7.—QUANTITY AND VALUE OF CORN, &c., imported into the United Kingdom in the undermentioned Years.

[*From Trade and Navigation Returns.*]

	Quantities.			Values.		
	1896.	**1897.**	**1898.**	**1896.**	**1897.**	**1898.**
Wheat from—	Cwt.	Cwt.	Cwt.	£	£	£
Russia . . .	17,241,600	15,049,900	6,232,500	5,187,240	5,439,052	2,540,388
Germany . . .	1,032,910	1,333,400	711,390	351,761	479,343	302,155
Turkey . . .	1,930,400	1,862,540	271,560	604,485	658,697	98,893
Roumania . . .	5,401,300	1,221,340	183,700	1,696,170	425,020	76,544
United States—						
On the Atlantic .	20,533,900	24,969,800	30,460,300	6,506,222	9,620,110	12,281,135
On the Pacific .	10,161,000	9,633,400	7,344,000	3,198,728	3,484,660	2,991,453
Chile	1,936,100	1,019,300	807,300	594,996	374,092	830,252
Argentine Republic .	4,927,600	933,100	4,034,700	1,440,320	318,871	1,765,446
British East Indies .	2,112,940	572,760	9,537,900	625,092	241,447	3,556,051
Australasia . .	6,500	..	211,620	2,080	..	79,762
British North America	3,617,900	4,820,500	5,012,030	1,092,372	1,875,058	1,948,147
Other countries . .	1,123,830	1,324,140	421,330	379,523	452,153	166,394
Total . .	70,025,980	62,740,180	65,228,330	21,678,989	23,363,503	26,136,620
Wheat and flour, from—						
Germany . . .	204,790	73,745	107,340	65,961	30,933	51,778
France . .	1,719,390	1,682,420	438,160	728,250	834,292	229,371
Austrian territories .	1,388,300	1,143,950	729,290	768,390	739,514	543,266
United States . .	15,905,100	14,062,970	17,445,890	6,786,600	7,089,094	9,470,438
British North America	1,932,720	1,530,690	1,968,800	816,950	803,389	1,058,277
Other countries . .	169,900	186,894	327,629	61,722	102,434	192,218
Total . .	21,320,200	18,680,669	21,017,109	9,227,873	9,599,656	11,545,343
Barley	22,477,322	18,958,720	24,457,004	5,709,531	4,681,074	6,791,472
Oats	17,586,730	16,116,810	15,577,900	4,226,317	4,038,813	4,383,457
Peas	3,018,657	2,820,135	2,179,062	852,634	771,055	689,899
Beans	3,102,990	2,840,050	2,293,346	837,417	762,275	670,159
Indian corn or maize .	51,772,100	53,785,380	57,169,292	9,422,539	9,188,708	11,282,310
Indian corn meal . .	368,100	1,029,301	1,453,800	123,313	261,120	379,485
Other kinds of corn and meal	..	..	..	721,470	918,270	1,020,513
Total of corn, &c.	..	..	..	52,800,083	53,579,474	62,899,258

TABLE NO. 8.—RETURN OF THE AVERAGE PRICES OF WOOL in the Years 1896 and 1897.

Years.	Australian.	South African.	British Fleeces.
	Per lb. *s.* *d.*	Per lb. *s.* *d.*	Per lb. *s.* *d.* *s.* *d.*
1896	0 8¾	0 7¾	0 5 to 1 0
1897	0 8¼	0 7½	0 5¼ " 0 11½

TABLE NO. 9.—QUANTITIES AND VALUES OF CORN, MEAT, FOOD PRODUCTS, in the Year 1898, with the

[*From Trade and*

	Quantities.			Values.		
	1896.	**1897.**	**1898.**	**1896.**	**1897.**	**1898.**
ANIMALS, LIVING:—	No.	No.	No.	£	£	£
Cattle . . .	562,553	618,321	569,066	9,305,055	10,460,996	9,399,793
Sheep and lambs .	769,592	611,504	663,749	1,133,634	919,096	984,863
Swine	4	..	450	10	..	1,020
Total value .	..	..	..	10,438,699	11,380,092	10,385,676
CORN.—	Cwt.	Cwt.	Cwt.	£	£	£
Wheat . . .	70,025,980	62,740,180	65,228,330	21,678,989	23,363,503	26,136,620
Wheat meal and flour	21,320,200	18,680,669	21,017,109	9,227,873	9,599,656	11,545,348
Barley . . .	22,477,322	18,958,720	24,457,004	5,709,531	4,681,074	6,791,472
Oats	17,586,730	16,116,810	15,577,900	4,226,317	4,038,813	4,888,457
Peas . . .	3,018,657	2,820,135	2,179,062	852,634	771,055	689,899
Beans . . .	3,102,990	2,840,050	2,293,346	837,417	762,275	670,159
Maize . . .	51,772,100	53,785,380	57,169,292	9,422,539	9,188,708	11,282,816
Maize-meal . .	368,100	1,029,301	1,453,800	123,318	261,120	379,465
Other kinds of corn and meal	.	..	..	721,470	913,270	1,020,513
Total value .	..	..	..	52,800,083	53,579,474	62,899,258
MEAT:—	Cwt.	Cwt.	Cwt.	£	£	£
Beef, salted . .	247,536	174,936	208,945	303,700	215,901	273,004
" fresh . .	2,659,700	3,010,387	3,100,221	5,028,828	5,783,667	5,915,615
Mutton, fresh . .	2,895,158	3,193,276	3,314,003	4,718,546	4,827,868	4,902,183
Bacon	4,549,526	5,004,915	5,711,322	7,854,515	8,867,846	10,321,674
Hams	1,459,412	1,725,875	1,972,052	3,136,089	3,681,966	3,894,839
Pork, salted (not Hams)	255,339	237,206	276,044	291,966	253,693	319,858
Pork, fresh . .	299,411	347,617	557,511	687,241	765,128	1,165,300
Meat, unenumerated —salted or fresh	279,390	364,822	414.977	554,064	727,273	812,767
Meat preserved otherwise than by salting	701,750	669,684	573,947	1,775,507	1,702,315	1,801,276
Rabbits . . .	170,873	276,458	314,398	401,614	543,494	572,608
Total of dead meat	13,518,095	15,005,176	16,443,420	24,752,070	27,369,151	29,979,119
DAIRY PRODUCE:—	Cwt.	Cwt.	Cwt.	£	£	£
Butter . . .	3,037,718	3,217,802	3,209,093	15,344,364	15,916,917	15,960,571
Margarine . . .	925,934	936,543	899,875	2,498,425	2,485,370	2,383,774
Cheese . . .	2,244,525	2,603,178	2,339,452	4,900,342	5,885,521	4,970,247
Total .	6,208,177	6,757,523	6,448,420	22,743,131	24,287,808	23,314,592
POULTRY, &c.:—				£	£	£
Poultry and game, alive or dead	..	..	..	705,478	780,725	636,488
	Gt. Hunds.	Gt. Hunds.	Gt. Hunds.			
Eggs	13,245,011	14,031,754	14,424,582	4,184,656	4,356,807	4,456,123
Total value .	..	..	..	4,890,134	5,087,532	5,092,611

AND ARTICLES AFFECTING AGRICULTURE, imported into the United Kingdom Corresponding Figures for 1896 and 1897.

Navigation Returns.]

	Quantities.			Values.		
	1896.	1897.	1898.	1896.	1897.	1898.
FRUIT, VEGETABLES, &c.:—						
Apples . . .	Bushels. 6,176,956	Bushels. 4,199,971	Bushels. 3,458,646	£ 1,582,495	£ 1,187,303	£ 1,107,058
Cherries . . .	219,367	312,294	401,810	105,811	178,131	230,828
Plums . . .	560,245	1,043,819	922,212	241,782	497,783	434,666
Pears	483,823	1,051,877	491,649	206,674	377,900	221,772
Grapes . . .	883,244	998,713	1,135,759	442,828	495,017	549,513
Oranges and lemons .	8,890,887	10,346,121	8,905,946	2,369,645	2,677,070	2,425,446
Unenumerated .	1,427,105	1,725,116	2,157,132	590,766	695,159	870,711
Onions . . .	6,086,905	6,108,924	6,002,515	681,949	760,560	792,907
Potatoes . . .	Cwt. 2,244,697	Cwt. 3,921,205	Cwt. 6,752,728	907,975	1,200,328	1,913,912
Vegetables, unenumerated (raw)	..	..	..	1,284,753	1,456,701	1,680,734
Hops	207,041	164,154	244,136	591,582	524,297	1,030,140
Total value	..	..	..	9,006,260	10,050,249	11,257,687
OTHER ARTICLES:—						
Lard	Cwt 1,739,463	Cwt. 1,740,468	Cwt. 2,106,870	£ 2,268,693	£ 1,998,143	£ 2,887,774
Wool, sheep and lambs'	Lb. 713,575,173	Lb. 735,627,420	Lb 689,346,799	24,958,346	24,436,871	23,437,309
Wood and timber—Hewn . . .	Loads. 2,432,790	Loads. 2,825,665	Loads. 2,335,302	4,889,374	5,780,639	4,900,618
Sawn or split, planed or dressed	6,031,492	7,024,492	6,359,828	13,380,580	16,639,931	15,047,801
Staves . . .	138,393	126,745	139,120	656,246	569,572	646,075
Oilseed cake . .	Tons. 316,073	Tons. 336,898	Tons. 391,247	1,589,214	1,834,729	2,284,244
Seeds—Clover and grass .	Cwt. 405,617	Cwt. 299,946	Cwt. 342,673	788,538	578,258	654,941
Cotton . .	Tons. 368,419	Tons. 412,876	Tons. 430,432	1,729,509	1,925,351	2,069,111
Flax and linseed .	Qrs 2,578,864	Qrs. 1,908,618	Qrs. 1,688,515	4,022,676	2,988,503	2,920,714
Rape . . .	179,730	185,232	258,951	195,527	258,233	367,741
Bones (whether burnt or not) . . .	Tons. 66,681	Tons. 59,228	Tons. 59,345	251,866	217,592	245,428
Guano . . .	20,214	16,734	23,634	104,354	89,812	117,924
Cotton, raw . .	Cwt. 15,668,663	Cwt. 15,394,289	Cwt. 19,004,886	36,272,039	32,195,172	34,125,551
Hemp . . .	Tons. 91,718	Tons. 89,019	Tons. 94,442	1,951,506	1,763,402	2,308,480
Flax	95,199	98,802	97,252	3,117,316	3,203,184	2,932,621
Hides untanned—Dry	Cwt. 369,063	Cwt. 557,087	Cwt. 542,454	905,425	1,418,166	1,455,806
Wet	604,734	638,668	694,057	1,319,516	1,336,991	1,450,260
Petroleum . . .	Gallons. 189,953,945	Gallons 185,665,376	Gallons. 219,250,539	3,732,056	3,335,271	3,733,630

Table No. 10.—Quantity and Value of Dead Meat imported into the United Kingdom in the undermentioned Years.

[*From Trade and Navigation Returns.*]

	Quantities.			Values.		
	1896.	1897.	1898.	1896.	1897.	1898.
Bacon, from—	Cwt.	Cwt.	Cwt.	£	£	£
Denmark . . .	1,222,114	1,026,552	1,017,520	2,791,794	2,744,430	2,701,112
Canada . . .	456,723	290,283	535,879	695,643	523,195	995,625
United States . .	2,751,518	3,592,635	4,087,389	4,066,708	5,358,624	6,438,239
Other countries . .	119,171	95,445	70,534	300,370	246,597	186,698
Total . .	4,549,526	5,004,915	5,711,322	7,854,515	8,867,846	10,321,674
Beef (salted), from—						
United States . .	240,630	171,970	203,645	294,551	212,184	266,660
Other countries . .	6,906	2,966	5,300	9,149	3,717	6,344
Total . .	247,536	174,936	208,945	303,700	215,901	273,004
Beef (fresh), from—						
United States . .	2,074,644	2,242,063	2,301,956	4,216,247	4,609,130	4,677,841
Australia . . .	523,778	634,255	624,407	720,775	937,189	953,388
Other countries . .	61,278	134,069	173,858	91,806	237,348	284,936
Total . .	2,659,700	3,010,387	3,100,221	5,028,828	5,783,667	5,915,615
Hams, from—						
Canada . . .	169,276	119,133	117,181	365,422	260,272	233,272
United States . .	1,285,976	1,603,533	1,851,520	2,758,474	3,411,559	3,651,414
Other countries . .	4,160	3,209	3,351	12,193	10,135	10,153
Total . .	1,459,412	1,725,875	1,972,052	3,136,089	3,681,966	3,894,839
Meat (unenumerated, salted or fresh), from—						
Holland . . .	163,277	224,635	249,939	345,272	471,958	517,507
United States . .	60,610	76,102	90,412	99,058	126,714	156,736
Other countries . .	55,503	64,085	74,626	109,734	128,601	138,524
Total . .	279,390	364,822	414,977	554,064	727,273	812,767
Meat, preserved otherwise than by salting—						
Beef	401,961	372,687	281,355	1,053,954	1,000,180	1,017,684
Mutton . . .	122,551	99,022	118,314	201,842	161,478	195,249
Other sorts . .	177,238	197,975	174,278	519,711	540,657	588,343
Total . .	701,750	669,684	573,947	1,775,507	1,702,315	1,801,276
Mutton (fresh), from—						
Germany . . .	3,610	2,321	1,270	9,050	5,764	2,815
Holland . . .	229,283	266,842	265,543	515,864	592,264	584,779
Australasia .	1,858,129	2,009,085	1,934,108	3,105,313	3,040,269	2,940,698
Argentine Republic .	801,733	908,623	1,106,201	1,071,891	1,175,129	1,357,926
Other countries . .	7,403	6,405	6,881	16,428	14,442	15.965
Total . .	2,895,158	3,193,276	3,314,003	4,718,546	4,827,868	4,902,183
Pork (salted, not Hams), from—						
United States . .	137,673	141,428	175,000	176,079	167,500	224,534
Other countries . .	117,666	95,778	101,044	115,887	86,193	95,324
Total . .	255,339	237,206	276,044	291,966	253,693	319,858
Pork (fresh), from—						
Holland . . .	244,344	226,215	222,672	556,527	488,755	474,462
Belgium . . .	39,208	36,832	35,102	98,340	92,570	88,258
Other countries . .	15,859	84,570	299,737	32,374	183,803	602,580
Total . .	299,411	347,617	557,511	687,241	765,128	1,165,300
Rabbits, from—						
Belgium . . .	91,595	84,430	84,505	251,109	227,192	228,876
Australia . . .	53,735	167,932	204,933	79,709	250,720	275,235
Other countries . .	25,543	24,096	24,960	70,796	65,582	68,492
Total . .	170,873	276,458	314,398	401,614	543,494	572,608
Total of dead meat	13,518,095	15,005,176	16,443,420	24,752,070	27,369,151	29,979,119

TABLE NO. 11.—QUANTITIES AND VALUES OF BUTTER, MARGARINE, CHEESE, AND EGGS imported into the United Kingdom in each Year from 1896 to 1898 inclusive.

[*From Trade and Navigation Returns.*]

	Quantities.			Values.		
	1896.	**1897.**	**1898.**	**1896.**	**1897.**	**1898.**
BUTTER from—	Cwt.	Cwt.	Cwt.	£	£	£
Sweden . .	323,829	299,214	294,962	1,664,685	1,515,705	1,501,668
Denmark .	1,228,784	1,334,726	1,465,030	6,288,413	6,748,163	7,359,831
Germany .	107,825	51,761	41,231	536,246	263,097	214,046
Holland . .	234,469	278,631	269,324	1,156,726	1,353,349	1,329,438
France . .	467,602	448,128	416,821	2,537,695	2,330,576	2,183,845
New S. Wales	7,777	23,835	34,391	37,691	112,218	167,616
Victoria . .	154,865	169,075	124,223	769,695	816,399	605,611
New Zealand .	56,370	76,522	69,949	277,898	366,956	338,400
Canada . .	88,357	109,402	156,865	339,744	444,862	660,935
United States .	141,553	154,196	66,712	617,525	633,549	285,309
Other countries	226,287	272,312	269,585	1,118,046	1,332,043	1,313,872
Total .	3,037,718	3,217,802	3,209,093	15,344,364	15,916,917	15,960,571
MARGARINE from—	Cwt.	Cwt.	Cwt.	£	£	£
Norway . .	10,158	10,827	8,477	28,102	29,785	22,799
Holland . .	861,887	872,595	844,177	2,304,335	2,292,162	2,211,309
France . .	30,523	30,563	30,299	104,556	106,105	105,309
Other countries	23,366	22,558	16,922	61,432	57,318	44,357
Total .	925,934	936,543	899,875	2,498,425	2,485,370	2,383,774
CHEESE from—	Cwt.	Cwt.	Cwt.	£	£	£
Holland . .	292,988	297,604	292,925	734,611	748,251	724,936
France . .	45,676	36,358	33,086	139,532	110,087	94,102
Australasia .	55,149	68,615	44,608	115,479	161,776	91,161
Canada . .	1,234,297	1,526,664	1,432,181	2,589,301	3,349,501	2,943,725
United States .	581,187	631,616	485,995	1,234,037	1,413,079	1,006,588
Other countries	35,228	42,321	50,657	87,382	102,827	109,735
Total .	2,244,525	2,603,178	2,339,452	4,900,342	5,885,521	4,970,247
EGGS from—	Great Hundreds.	Great Hundreds.	Great Hundreds.	£	£	£
Russia . .	2,406,168	3,132,333	3,645,903	630,052	812,297	966,129
Denmark .	1,566,623	1,748,800	2,019,508	522,985	596,282	685,447
Germany .	2,930,486	2,971,846	2,821,128	782,121	813,022	788,844
Belgium . .	2,243,909	2,464,182	2,349,902	694,322	768,077	729,876
France . .	3,275,776	2,675,667	2,115,096	1,273,200	1,022,869	817,336
Canada . .	500,317	568,769	745,355	178,931	193,998	251,710
Other countries	321,732	470,157	727,690	103,045	150,262	216,781
Total .	13,245,011	14,031,754	14,424,582	4,184,656	4,356,807	4,456,12

TABLE No. 12.—PRICES OF LIVE STOCK IN 1895, 1896, AND 1897, as returned under the Markets and Fairs (Weighing of Cattle) Act, 1891.

[*From Journal of the Board of Agriculture.*]

NUMBER OF ANIMALS REPORTED AS ENTERING THE 19 SCHEDULED PLACES IN GREAT BRITAIN, TOGETHER WITH THE NUMBERS WEIGHED AND THE NUMBERS PRICED.

ANIMALS.	1897.	1896.	1895.
CATTLE :—	No.	No.	No
Entering markets	1,115,183	1,100,014	1,186,149
Weighed	111,767	109,184	100,033
Prices returned	100,371	99,537	88,403
Prices returned with breed and quality distinguished	78,329	75,014	64,072
SHEEP :—			
Entering markets	4,194,310	4,309,943	4,330,256
Weighed	41,969	41,685	34,886
Prices returned with breed and quality distinguished	36,692	35,048	23,577
SWINE :—			
Entering markets	211,613	232,344	233,189
Weighed	2,333	4,585	2,803
Prices returned . . .	1,368	1,686	1,226
Prices returned with breed and quality distinguished	1,368	1,686	17

CALCULATED AVERAGE PRICE PER LIVE CWT. IN TEN SELECTED PLACES.

(*Obtained by dividing the total price by the total weight of the weighed animals of all descriptions in each of the three qualities or grades.*)

PLACES	Inferior or third quality		Good or second quality.		Prime or first quality	
	1897.	1896.	1897.	1896.	1897.	1896.
	Per cwt s. d	Per cwt s d	Per cwt s d	Per cwt s d	Per cwt s d	Per cwt s d
ENGLAND :—						
Leeds	27 8	26 10	30 4	29 2	32 4	32 2
Liverpool	25 10	...	30 0	28 4	32 8	32 4
London	28 4	27 8	33 8	32 8	38 10	37 0
Newcastle . . .	27 2	26 0	30 8	30 4	36 2	33 10
Shrewsbury . . .	25 4	25 0	30 6	30 0	34 6	34 4
SCOTLAND :—						
Aberdeen	24 8	23 8	33 0	31 6	36 0	34 10
Dundee	27 6	25 2	32 6	31 4	35 2	33 6
Edinburgh . . .	...	27 2	33 10	32 6	35 8	33 4
Glasgow	30 8	31 6	32 10	31 4	35 10	35 0
Perth	31 4	29 10	33 10	31 10	35 10	33 10

TABLE No. 13.—NUMBER AND VALUE OF LIVE CATTLE, SHEEP, AND SWINE imported into the United Kingdom in the undermentioned Years [*From Trade and Navigation Returns.*]

	Number.			Value.		
	1896.	**1897.**	**1898.**	**1896.**	**1897.**	**1898.**
CATTLE, from—				£	£	£
Channel Islands . .	1,719	1,633	1,814	32,106	31,048	34,785
Canada . . .	101,591	126,495	108,406	1,607,899	2,045,209	1,774,760
United States . .	393,119	416,299	369,478	6,785,519	7,230,854	6,288,984
Argentine Republic .	65,699	73,852	89,368	923,638	1,153,507	1,351,264
Other countries .	425	42		5,893	378	
Total . .	562,553	618,321	569,066	9,305,055	10,460,996	9,399,793
SHEEP AND LAMBS, from—						
Canada . . .	83,767	63,761	42,070	125,956	95,602	63,286
United States	266,760	186,755	147,021	405,803	272,421	219,706
Argentine Republic	339,381	345,217	430,075	501,712	528,607	637,388
Other countries .	79,684	15,771	44,583	100,163	22,466	64,483
Total . .	769,592	611,504	663,749	1,133,634	919,096	984,863
SWINE (not separately enumerated)	4		450	10		1,020
TOTAL VALUE OF ANIMALS LIVING				10,438,699	11,380,092	10,385,676

TABLE No. 14.—NUMBER OF HORSES, CATTLE, SHEEP, AND PIGS imported into Great Britain from Ireland in each of the Years 1892-98.

	1892	**1893.**	**1894.**	**1895.**	**1896.**	**1897.**	**1898.**
HORSES :—							
Stallions .	113	151	163	188	191	153	150
Mares	14,273	13,356	14,484	15,370	18,046	17,590	18,200
Geldings .	18,095	16,883	18,942	19,002	21,619	20,679	20,454
Total	32,481	30,390	33,589	34,560	39,856	38,422	38,804
CATTLE Oxen, Bulls, and Cows—							
Fat . .	256,538	316,344	330,748	302,555	274,472	259,173	278,770
Store . .	305,373	318,545	422,534	414,859	349,800	419,302	460,903
Other cattle	6,278	8,473	7,805	5,622	3,837	5,043	4,101
Calves .	56,268	45,307	65,867	68,571	53,451	62,494	59,588
Total . .	624,457	688,669	826,954	791,607	681,560	746,012	803,362
SHEEP :—							
Sheep . .	713,528	705,299	574,471	351,975	397,164	435,709	449,558
Lambs . .	366,674	402,661	382,630	300,603	340,142	368,806	383,900
Total .	1,080,202	1,107,960	957,101	652,578	737,306	804,515	833,458
PIGS —							
Fat . .	457,977	405,242	515,647	500,700	574,677	653,459	556,723
Store . . .	42,974	51,329	69,820	46,520	35,912	41,848	32,062
Total . .	500,951	456,571	584,967	547,220	610,589	695,307	588,785

EDINBURGH CORN-MARKET GRAIN TABLES for WHEAT, BARLEY, OATS, and BEANS, showing the Quantity offered for Sale, the Quantity Sold, the Highest, Lowest, and Average Prices; also the Bushel-weights of the Highest and Lowest Prices of each kind of Grain for every Market-day, likewise the Results for every Month, and the final Result for the year 1898.

WHEAT.

Date.	Quantity offered for Sale.	Quantity Sold.	Highest Price	Lowest Price.	Average Price.	Table of Bushel-weights for Highest Price		Table of Bushel-weights for Lowest Price.	
1898 Jan.	Imp. qr.	Imp. qr.	*s. d.*	*s d.*	*s d*	lb	lb.	lb	lb
5	599	519	36 9	30 0	34 10		63		60
12	706	654	36 6	32 8	35 0		63½		59½
19	1,174	738	36 6	27 0	34 7		63		58¾
26	1,556	976	38 0	32 6	34 11		63½		61
	4,035	2,887	36 7	30 10	34 10				
Feb									
2	595	430	35 6	27 8	34 1		63		63½
9	952	627	36 0	30 6	34 7		63		62
16	783	657	36 0	30 0	34 4	62	63½		62
23	784	592	36 6	30 6	34 5		63¾		61
	3,114	2,306	36 0	29 8	34 4				
March									
2	928	847	36 0	26 0	34 4		63		62
9	501	400	36 0	33 6	34 10		63		63
16	599	362	36 6	32 6	34 11		63		62
23	581	345	35 3	31 6	34 2		63½		60½
30	693	613	35 6	28 6	34 1		63		59
	3,302	2,567	35 11	32 2	34 5				
April									
6	307	307	35 0	34 0	34 8	62	63		63
13	296	197	36 0	34 3	35 4		63		63
20	669	431	38 0	33 6	37 1	63	63¾		60
27	1,488	446	45 0	37 0	42 8		63		63
	2,760	1,381	37 5	34 3	38 1				
May									
4	3,740	2,825	45 6	35 0	42 11		63¾		58
11	4,058	1,628	49 6	40 0	46 8		65¼		59¾
18	3,967	2,140	47 0	35 0	45 6		65		58½
25	2 793	2,216	46 9	35 0	45 1		63		58½
	14 558	8,809	47 [illegible]	36 0	44 10				
June									
1	1,882	1,129	45 9	37 0	44 2		63		60
8	1,663	605	43 0	31 0	41 2		63		59½
15	1,372	412	41 8	30 0	37 8		65½		61½
22	880	296	40 0	29 6	36 10		63½		62
29	756	85	34 6	34 0	34 4		64		63
	6,553	2,527	42 4	32 10	41 3				
July									
6	276	161	35 6	33 0	34 6		63		62
13	416	198	36 0	33 3	34 8		63½		63
20	567	339	35 6	33 0	34 10		63	62	63
27	789	361	35 0	33 0	34 2		63¾		63
	2 048	1,059	35 5	31 1	34 6				

WHEAT—*continued.*

Date.	Quantity offered for Sale.	Quantity Sold.	Highest Price.		Lowest Price.		Average Price.		Table of Bushel-weights for Highest Price.		Table of Bushel-weights for Lowest Price.	
1898 Aug.	Imp. qr.	Imp. qr	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	lb.	lb.	lb.	lb.
8	832	469	34	0	26	0	32	8		63		58½
10	1,196	925	34	0	29	0	32	9		63		63
17	1,444	746	33	0	26	0	31	7		64		63
24	1,624	118	31	0	29	0	29	4		63		63
31	1,146	480	29	0	25	6	28	11	62	63¼		60
	6,242	2,738	29	8	28	4	31	7				
Sept.												
7	785	535	30	6	28	6	29	5		63		63
14	473	121	29	6	25	6	28	5		63		63
21	679	520	30	0	25	0	28	5		64		62
28	681	248	29	6	24	0	26	7		64½		60½
	2,618	1,424	30	0	26	0	28	6				
Oct												
5	677	417	29	0	24	0	26	4		63		63
12	1,196	520	32	6	23	0	27	1		63		61
19	1,025	564	35	0	22	0	27	4		63		59
26	1,057	692	31	0	21	0	28	0		63		59½
	3,955	2,193	31	3	28	3	27	4				
Nov.												
2	986	507	31	0	24	0	28	8	63	63½		60½
9	908	700	31	0	26	0	28	8		63		59½
16	708	426	30	3	26	6	28	8		63		62½
23	825	626	30	0	27	0	28	11	62	63		63
30	473	447	30	0	25	0	29	0	63	63¾		63
	3,900	2,706	30	4	26	3	28	9				
Dec.												
7	461	316	29	0	25	0	27	9		63		63
14	527	510	32	0	23	6	27	11		63		57½
21	794	656	29	6	27	0	28	5		64¼		63
28	933	661	29	6	26	0	28	4	62¾	63		63
	2,715	2,143	29	5	26	2	28	2				
Result for Year	55,800	32 740	34	11	29	10	36	1				

BARLEY.

1898 Jan.												
5	1,531	936	32	0	25	0	29	4		56		55
12	1,740	1,097	32	6	27	6	30	2		56		53½
19	2,158	1,460	32	0	25	9	30	4	56	56¼		52
26	2,411	977	31	6	27	6	29	8		56	52½	54
	7,840	4,470	32	0	27	1	29	11				
Feb.												
2	1,929	1,252	32	6	23	9	29	8		56½		49
9	2,443	1,510	32	0	26	6	29	6		56	55½	56
16	2,141	1,002	36	0	28	0	30	0		56	54	56
23	1,829	966	35	0	25	0	30	0		56		52
	8,842	4,730	34	4	27	1	29	9				

BARLEY—*continued.*

Date	Quantity offered for Sale.	Quantity Sold.	Highest Price.		Lowest Price.		Average Price.		Table of Bushel-weights for Highest Price.		Table of Bushel-weights for Lowest Price.	
1898 March	Imp. qr.	Imp. qr	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	lb.	lb.	lb.	lb.
2	2,055	1,211	35	0	28	6	30	2		58		56
9	1,717	760	35	0	26	6	30	10		57		53
16	1,719	612	32	6	27	3	29	11		57		55
23	1,180	651	32	0	28	0	30	1		56		52½
30	833	515	32	0	28	6	30	2		56		55
	7,504	3,749	33	10	28	1	30	3				
April 6	573	386	32	3	28	6	30	10		56		56
13	240	230	31	6	29	9	30	10		56		56
20	311	203	31	6	30	9	31	1		56		56
27	157	77	31	6	30	0	31	2		56		55
	1,281	896	31	7	30	4	30	11				
May 4	307	195	31	6	29	0	30	4		56¼		53½
11	322	252	31	8	28	0	30	6		56		53½
18	117	56	30	0	29	0	29	8	55¾	56		54½
25	114	114	30	0	26	6	29	5		56		53½
	860	617	30	7	28	2	30	2				
June 1	23	23	28	0	..		28	0		52½		..
8	.	..	..		.		..			..		.
15			..		.		.					
22	12	12	28	0			28	0		56		
29	21	21	28	6			28	6		56¼		
	56	56	28	2	.		28	2				
July 6	..		.		.							
13	33	33	29	6	29	0	29	2		55		55
20			.		.					.		
27	14				..		.					
	47	33	29	6	29	0	29	2				
Aug 3		.					.					
10	20	20	29	0	..		29	0		56		
17	195	60	29	0	28	0	28	10		56		56
24	170	70	32	9	28	6	30	11		56		56
31	770	615	32	0	28	0	30	7	56	56½		56
	1,155	765	31	4	28	2	30	6				
Sept. 7	2,592	2,098	31	6	25	6	28	11		56½		56
14	2,286	1,508	29	6	24	0	27	1	56	56½		56
21	1,317	1,167	29	0	25	0	26	7		57	55	56
28	2,021	1,448	28	6	23	0	27	1		56		54
	8,216	6,221	30	5	24	9	27	7				
Oct. 5	1,099	764	29	0	24	6	26	7		56		56
12	1,620	1,193	29	6	24	0	27	2		58½		56
19	1,188	783	30	0	19	0	27	6		56		52
26	1,977	1,393	30	0	24	0	28	4		57½	53½	56
	5,879	4,133	29	9	23	5	27	6				

BARLEY—*continued.*

Date	Quantity offered for Sale	Quantity Sold	Highest Price	Lowest Price.	Average Price	Table of Bushel-weights for			
						Highest Price		Lowest Price	
1898 Nov	Imp qr	Imp qr	*s d*	*s d*	*s d*	lb	lb	lb.	lb.
2	1,986	1,001	30 0	25 0	28 1		56		56
9	2,102	1,934	30 0	26 0	28 6		56		56
16	2,687	2,294	31 0	24 0	28 5		56		55½
23	1,973	1,535	32 6	25 0	28 8		56		55
30	1,818	1,672	31 6	25 6	29 0		56		56
	10,566	8,436	30 7	25 3	28 7				
Dec									
7	1,529	914	32 0	27 0	29 10		56		55
14	3,022	1,751	32 0	26 6	29 7		56		55
21	2,207	1,479	30 6	24 9	28 9		56		56
28	1,836	1,025	31 0	22 0	28 9		56		51½
	8,594	5,169	31 3	25 1	29 8				
Result for year	60,340	39,275	30 11	26 6	29 0				

OATS.

Date	Quantity offered for Sale	Quantity Sold	Highest Price	Lowest Price.	Average Price	Highest Price		Lowest Price	
1898 Jan									
5	2,287	2,125	23 0	17 0	20 9		45½		41
12	2,510	2,090	24 0	19 0	21 4		45½	41	42½
19	3,500	2,527	23 6	18 6	21 6	44	44½		40
26	3,751	1,736	24 0	18 6	21 6		45½		42
	12,048	8,478	23 7	18 7	21 8				
Feb									
2	3,973	1,801	24	18 3	21 3		44½		41
9	3,967	2,086	23 6	18 6	21 2	43½	45½	41	42
16	4,359	2,101	24 6	17 0	21 0		44½		40
23	4,278	2,036	23 6	18 6	21 4	44	44½		40
	16,577	8,024	23 10	18 5	21 2				
March									
2	4,431	1,732	25 0	18 3	21 7		47		40
9	3,900	1,936	25 6	18 6	21 8		45½		41
16	3,316	2,031	25 6	19 3	22 2		45		41
23	3,254	1,621	25 0	20 0	22 5	44	44½		41
30	2,390	1,602	24 9	20 0	22 5		44½	41	42
	17,291	8,922	25 1	19 5	22 0				
April									
6	2,145	1,531	25 0	19 6	23 1		44		40
13	2,571	1,694	25 0	20 0	23 3		45		40
20	3,083	1,485	25 6	21 6	23 8		44½	41	42½
27	1,885	1,075	27 0	21 6	25 4	44	45½		40
	9,634	5,785	26 5	20 10	23 8				
May									
4	3,889	1,447	27 0	23 6	25 7	44½	45		42
11	3,526	1,695	27 6	23 6	25 11	44½	45½	41	42½
18	3 274	1,192	27 3	22 3	25 6	45			40
25	2,948	945	27 0	22 6	25 8	44½	45½		40
	13,582	5,279	27 2	22 10	25 8				

Oats—*continued.*

Date.	Quantity offered for Sale.	Quantity Sold.	Highest Price	Lowest Price.	Average Price.	Table of Bushel-weights for			
						Highest Price		Lowest Price.	
1898	Imp. qr.	Imp. qr	*s. d*	*s. d*	*s. d*	lb.	lb	lb.	lb.
June									
1	2,255	609	27 0	23 6	25 6	44	44½		40
8	2,345	461	26 9	23 3	25 6	44½	45		42
15	2,058	847	26 6	23 0	25 3		45		42
22	2,494	878	25 6	22 0	24 8	44½	45		42
29	1,875	346	25 0	21 0	23 11	44½	45		40
	11,027	3,141	26 2	22 9	25 0				
July									
6	1,420	683	25 3	22 0	23 9		44½		42
13	1,706	888	25 6	21 6	24 3		45½		42
20	1,239	707	25 6	20 0	24 0	44½	45		38
27	1,667	878	25 6	22 9	24 7		44½		42
	6,032	3,106	25 6	21 10	24 2				
Aug.									
3	2,059	1,283	25 6	23 0	24 7	44½	45½		41½
10	2,105	807	25 3	21 9	24 4	44½	45		40
17	2,241	771	25 9	20 6	23 11		46		40
24	2,423	667	25 0	19 6	23 5	42¾	4[illegible]		42
31	2,213	920	25 6	20 0	23 4		44½		42
	11,041	4,448	25 4	20 8	24 0				
Sept.									
7	2,637	1,588	24 0	19 0	21 2	44	44½		42
14	2,137	1,389	22 6	1[illegible] 6	20 6		44	42	43
21	1,837	1,502	23 6	17 0	19 9		44½		42
28	2,060	1,413	24 0	18 0	20 7		41½		4[illegible]
	8,671	5,892	23 3	17 11	20 6				
Oct									
5	2,207	1,510	24 0	17 9	20 0		44½		41
12	2,546	2,076	22 0	17 0	19 8	42	44½		42¼
19	1,953	1,346	23 0	17 0	19 10		45½	41	42
26	1,953	1,458	22 0	17 0	19 11	44½	45		41
	8,659	6,385	22 5	17 3	19 10				
Nov									
2	2,405	1,660	21 6	17 0	20 1	44½	45¼		40½
9	2,339	1,693	23 0	15 0	20 0		44½		40
16	2,244	1,219	22 3	17 0	19 9		45		42½
23	3,309	1,243	22 3	12 0	19 6		43½		41
30	3,123	1,905	21 6	16 0	19 5	45	46		42
	13,420	7,720	21 8	16 5	19 9				
Dec									
7	3,309	2,072	22 0	16 6	19 3		44¼		40
14	3,053	1,895	21 6	16 6	19 4	44½	45¾		40
21	2,928	1,875	21 0	16 0	19 0		45½		42
28	2,303	1,542	21 0	16 0	18 9		45¼		42
	11,593	7,884	21 8	16 2	19 1				
Result for year	139,575	74,564	24 8	19 6	21 9				

BEANS.

Date.	Quantity offered for Sale.	Quantity Sold.	Highest Price.	Lowest Price.	Average Price.	Table of Bushel-weights for Highest Price.	Table of Bushel-weights for Lowest Price.
1898	Imp. qr.	Imp. qr.	s. d.	s. d.	s. d.	lb. lb.	lb. lb.
Jan.							
5	68	22	30 8	..	30 3	64 64¼	..
12	80	10	33 6	..	33 6	66¼	..
19	21	8	31 0	..	31 0	68¾	..
26	68	68	31 6	31 0	31 1	67¼	65½ 66
	237	108	31 8	31 0	31 2		
Feb.							
2	248	203	32 6	28 0	30 9	66½	62
9	201	138	34 0	29 0	30 11	64½	62
16	262	99	35 6	28 9	30 4	65½	63
23	237	140	36 0	29 0	31 9	64¾ 65	64½
	948	580	33 8	28 10	30 11		
March							
2	264	103	33 0	27 0	30 6	66½	63
9	277	77	34 0	30 6	31 7	68	64½
16	230	52	32 6	27 0	29 9	63¾	63
23	92	44	31 6	31 0	31 4	64	65 66
30	41	..	..	..	..	..	..
	904	276	32 2	29 8	30 10		
April							
6	25	25	30 6	..	30 6	65	..
13	61	21	31 6	..	31 6	65½	..
20	80	..	..	..	..	..	..
27	37	..	..	..	..	..	..
	203	46	30 11		30 11		
May							
4	..	..	..	..	..	..	..
11	..	..		..	..	..	..
18	..	..	..	..	..	..	..
25	..	..	..	..		..	..
	..	..	..	..	..		
June							
1	..	..	..	..	..	..	..
8	..	..	..	..	..	..	..
15	..	..	..	..	..	..	..
22	..	..	..	..	..	..	..
29	..	..	..	..	..	..	..
	..	..	..	..	..		
July							
6	..	..	..	..	..	..	..
13	15	15	35 3	..	35 3	68	..
20	..	..	..	..	..	..	..
27	18	..	..	..	..	..	..
	33	15	35 3	..	35 3		
Aug.							
3	22	..	..	..	..	..	..
10	..	..	..	..	..	..	..
17	20	..	..	..	..	..	..
24	..	..	..	..	..	..	..
31	17	..	..	..	..	..	..
	59	..	..	..	..		

BEANS—*continued.*

Date.	Quantity offered for Sale.	Quantity Sold.	Highest Price.	Lowest Price.	Average Price.	Table of Bushel-weights for	
						Highest Price.	Lowest Price.
1898 Sept.	Imp. qr.	Imp. qr.	*s.* *d.*	*s.* *d.*	*s.* *d.*	lb. lb.	lb. lb.
7	..	..	..	..	..	..	..
14	10	..	..	..	..	..	..
21	..	..	..	..	.	.	..
28	35	15	32 0	..	32 0	63	..
	45	15	32 0	..	32 0		
Oct.							
5	35	5	34 0	..	34 0	63	..
12	35	..	..	..	..	..	..
19	75	..	..	..	..	..	..
26	13	..	..	..	..	..	..
	158	5	34 0	..	34 0		
Nov							
2	13	13	31 6	..	31 6	63	..
9	15	.		..		..	.
16	..	..	..	..	..		..
23	15	.	.		.	..	
30	.			..	..		..
	43	13	31 6	.	31 6		
Dec.							
7	.	..	..	..	.	..	.
14	70	24	31 0	30 0	30 7	63	68½
21	91	36	31 3	30 6	30 11	63	68
28	68	18	30 9	..	30 9	65	.
	229	73	31 0	30 4	30 9		
Result for year	2,859	1,131	32 3	29 10	31 0		

PRICES OF SHEEP SINCE 1818.

TABLE No. 1.—CHEVIOT SHEEP.

Year.	Wethers.					Ewes.					Lambs.				
	s.	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*
1818	28	0	to	30	0	not quoted.					8	0	to	10	0
1819	25	0	"	27	0	15	0	to	17	0	10	6	"	12	0
1820	20	0	"	25	0	16	0	"	17	0	10	0	"	11	0
1821	18	0	,	20	0	14	0	"	16	0	7	6	"	8	0
1822	12	6	"	13	0	8	0	"	8	6	4	6	"	0	0
1823	13	6	"	18	0	7	0	"	10	6	5	6	"	6	0
1824	14	0	"	19	0	7	0	"	9	0	4	6	"	6	0
1825	20	0	"	32	0	15	0	"	19	0	9	0	"	10	6
1826	17	6	"	21	6	13	0	"	15	0	7	0	"	7	6
1827	15	0	"	24	0	not quoted.					7	0	"	8	0
1828	18	0	"	27	6	12	0	to	15	0	7	0	"	8	3
1829	18	0	"	24	0	12	6	"	14	0	7	0	"	8	6
1830	15	0	"	21	0	8	0	"	11	0	6	0	"	6	9
1831	18	0	"	25	0	9	0	"	13	0	7	0	"	8	0
1832	19	0	"	24	0	11	0	"	16	0	7	0	"	9	0
1833	22	0	"	31	0	13	6	"	20	0	8	0	"	11	3
1834	22	0	"	31	0	13	6	"	21	0	9	0	"	11	6
1835	22	0	"	27	6	18	0	"	20	6	8	0	"	11	0
1836	24	0	"	31	6	16	0	"	19	0	10	0	"	14	0
1837	19	0	"	28	0	14	0	"	19	0	10	0	"	13	0
1838	23	0	"	30	6	17	0	"	22	0	12	0	"	14	0
1839	23	0	"	31	0	14	0	"	19	0	0	0	"	13	0
1840	24	0	"	33	0	15	0	"	23	0	7	0	"	11	6
1841	23	0	"	30	0	14	0	"	22	0	8	0	"	12	0
1842	22	6	"	28	0	13	0	"	17	0	7	6	"	10	0
1843	19	0	"	25	0	8	0	"	12	0	5	0	"	8	0
1844	21	0	"	29	0	10	0	"	16	0	8	0	"	10	6
1845	23	0	"	33	0	13	0	"	20	0	8	0	"	13	0
1846	24	0	"	33	6	14	6	"	21	6	10	0	"	14	6
1847	24	0	"	35	0	13	0	"	24	0	11	6	"	15	0
1848	23	0	"	34	6	13	0	"	28	0	11	6	"	15	0
1849	21	0	"	30	2	12	0	"	21	0	0	0	"	14	0
1850	20	6	"	29	6	12	0	"	20	0	8	0	"	13	0
1851	21	6	"	31	0	13	0	"	21	0	8	9	"	14	0
1852	21	0	"	32	0	15	0	"	23	0	8	0	"	14	0
1853	26	6	"	38	0	17	0	"	28	6	9	0	"	17	0
1854	25	0	"	36	0	17	0	"	26	0	9	0	"	16	6
1855	23	6	"	36	0	16	0	"	25	0	10	0	"	17	0
1856	22	0	"	35	6	15	6	"	24	0	10	0	"	15	0
1857	24	0	"	36	0	14	6	"	26	0	10	6	"	14	6
1858	24	0	"	34	6	14	0	"	24	6	10	6	"	14	0
1859	25	0	"	34	6	16	0	"	25	0	10	3	"	14	9
1860	26	0	"	38	0	17	6	"	27	6	12	6	"	17	6
1861	25	0	"	38	6	16	0	"	28	0	9	0	"	16	0
1862	27	0	"	37	6	17	6	"	28	0	10	0	"	16	0
1863	25	0	"	38	6	19	0	"	28	6	10	6	"	16	0
1864	31	0	"	41	0	21	0	"	31	6	14	0	"	18	0
1865	32	6	"	44	0	22	6	"	33	6	14	6	"	20	0
1866	37	0	"	50	0	29	0	"	42	6	15	0	"	26	0
1867	26	0	"	58	0	18	0	"	25	6	12	0	"	16	0
1868	30	0	"	32	0	15	6	"	21	0	7	6	"	13	0
1869	28	0	"	38	0	15	0	"	22	6	7	6	"	14	0
1870	35	6	"	43	0	18	0	"	28	0	10	0	"	17	0
1871	36	6	"	49	0	22	0	"	33	6	14	0	"	20	0
1872	45	0	"	56	0	32	0	"	42	0	16	0	"	22	0
1873	42	0	"	51	0	25	0	"	42	0	15	6	"	22	0
1874	33	6	"	44	6	21	0	"	36	0	12	0	"	17	0
1875	33	0	"	48	6	21	0	"	34	0	13	6	"	23	6
1876	40	0	"	52	6	23	0	"	30	0	13	6	"	25	0
1877	41	0	"	51	0	25	0	"	37	0	15	0	"	24	0
1878	35	6	"	48	0	28	6	"	35	0	14	0	"	22	0
1879	34	0	"	44	0	21	0	"	34	0	14	0	"	20	0
1880	30	0	"	43	6	20	0	"	30	0	12	6	"	20	0
1881	32	0	"	45	6	29	0	"	34	0	14	0	"	20	0
1882	40	0	"	51	0	30	0	"	40	0	14	0	"	20	6
1883	44	0	"	55	6	34	6	"	46	6	15	6	"	23	0
1884	36	0	"	47	6	29	6	"	41	6	12	6	"	20	0

TABLE No. 1.—CHEVIOT SHEEP—*Continued.*

Year.	Wethers.					Ewes.					Lambs.				
	s.	*d.*		*s.*	*d.*	*s*	*d.*		*s*	*d.*	*s*	*d.*		*s.*	*d.*
1885	30	0	to	38	0	24	0	to	31	0	12	0	to	18	0
1886	32	0	〃	40	0	21	0	〃	29	0	12	6	〃	19	0
1887	29	0	〃	36	0	18	0	〃	26	0	11	0	〃	16	6
1888	30	0	〃	38	0	19	0	〃	27	0	12	0	〃	17	6
1889	36	0	〃	44	0	24	0	〃	32	0	14	0	〃	22	0
1890	31	0	〃	40	0	22	0	〃	30	0	12	6	〃	20	0
1891	27	0	〃	38	0	16	0	〃	25	0	9	0	〃	16	0
1892	22	0	〃	30	6	13	0	〃	22	0	5	0	〃	11	0
1893	26	0	〃	35	6	18	0	〃	28	6	8	6	〃	15	0
1894	26	0	〃	37	0	20	0	〃	31	0	10	6	〃	18	6
1895	28	0	〃	39	0	22	0	〃	34	0	11	6	〃	19	6
1896	24	6	〃	34	0	19	0	〃	30	6	9	0	〃	16	6
1897	27	0	〃	36	0	21	0	〃	31	6	11	0	〃	17	6
1898	27	0	〃	37	0	22	0	〃	32	6	12	0	〃	18	6

TABLE No. 2.—BLACKFACED SHEEP.

Year.	Wethers.					Ewes.					Lambs.				
	s.	*d.*		*s.*	*d.*	*s.*	*d.*		*s*	*d.*	*s.*	*d.*		*s.*	*d.*
1819	22	0	to	24	0	12	0	to	15	0	8	0	to	9	0
1820	20	0	〃	23	3	15	6	〃	17	0	7	0	〃	8	6
1821	18	0	〃	20	0	12	0	〃	13	0	6	0	〃	7	0
1822	11	6	〃	13	6	5	6	〃	6	0	4	6	〃	0	0
1823	12	0	〃	16	0	5	0	〃	6	6	4	0	〃	5	3
1824	9	6	〃	13	6	6	0	〃	7	0	4	0	〃	5	0
1825	22	0	〃	26	0	11	0	〃	13	6	6	0	〃	9	0
1826	15	0	〃	17	0	8	0	〃	9	0	4	6	〃	6	0
1827	14	0	〃	18	6	7	0	〃	10	0	6	0	〃	7	6
1828	15	0	〃	20	0	8	0	〃	11	0	5	0	〃	7	6
1829	14	0	〃	18	0	9	0	〃	10	0	6	0	〃	7	0
1830	9	6	〃	13	0	4	0	〃	6	0	4	6	〃	6	0
1831	13	0	〃	17	0	5	0	〃	7	6	5	0	〃	6	6
1832	14	0	〃	18	0	7	0	〃	11	6	6	0	〃	7	8
1833	16	0	〃	24	0	7	6	〃	12	0	6	6	〃	9	0
1834	16	0	〃	22	0	10	0	〃	13	0	6	0	〃	8	6
1835	15	0	〃	18	9	10	0	〃	13	0	7	0	〃	8	0
1836	15	0	〃	21	0	9	0	〃	12	0	8	6	〃	11	0
1837	13	0	〃	16	0	8	0	〃	12	0	8	0	〃	9	6
1838	15	0	〃	20	6	10	0	〃	13	0	not quoted				
1839	15	0	〃	22	0	10	0	〃	12	0	7	0	to	8	3
1840	15	0	〃	22	6	11	0	〃	12	0	7	0	〃	9	3
1841	16	0	〃	20	0	9	0	〃	11	0	6	0	〃	8	0
1842	14	0	〃	19	0	7	6	〃	8	0	5	6	〃	7	0
1843	not quoted.					4	9	〃	6	6	not quoted.				
1844	15	0	to	21	0	6	6	〃	10	0	5	0	to	8	0
1845	14	0	〃	23	0	8	0	〃	12	0	6	0	〃	8	0
1846	13	0	〃	24	0	10	0	〃	13	0	8	0	〃	9	0
1847	20	6	〃	25	0	10	0	〃	14	0	8	6	〃	9	6
1848	20	0	〃	24	0	11	3	〃	12	0	8	6	〃	10	0
1849	not quoted.					not quoted					7	0	〃	7	6
1850											7	0	〃	0	0
1851	17	6	to	23	0	9	0	to	12	0	6	6	〃	8	0
1852	18	6	〃	22	0	9	6	〃	12	0	4	6	〃	7	9
1853	23	0	〃	27	0	14	6	〃	16	6	8	0	〃	11	6
1854	20	0	〃	26	0	11	0	〃	16	6	8	0	〃	10	6
1855	23	6	〃	26	6	14	0	〃	16	0	10	0	〃	11	0
1856	17	0	〃	24	0	10	0	〃	20	0	7	6	〃	10	0
1857	20	0	〃	29	0	10	6	〃	15	0	9	3	〃	11	0
1858	20	0	〃	27	6	9	9	〃	18	9	8	3	〃	10	6
1859	20	0	〃	25	0	10	0	〃	14	0	8	9	〃	11	0
1860	21	0	〃	27	3	11	0	〃	16	0	10	0	〃	13	6
1861	21	0	〃	29	0	12	0	〃	22	0	6	3	〃	14	0
1862	16	9	〃	27	0	12	0	〃	18	8	6	0	〃	12	0

Table No. 2.—BLACKFACED SHEEP—*Continued.*

Year.	Wethers.					Ewes.					Lambs.				
	s.	*d.*		*s.*	*d.*	*s*	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*
1863	20	0	to	30	6	13	0	to	16	0	8	0	to	11	6
1864	25	0	"	30	0	15	0	"	19	0	10	0	"	13	6
1865	15	6	"	32	6	15	0	"	25	0	10	0	"	17	0
1866	31	6	"	40	0	20	0	"	36	0	13	6	"	22	6
1867	20	0	"	30	6	14	0	"	22	0	7	6	"	13	6
1868	20	0	"	26	0	10	6	"	13	6	7	0	"	13	0
1869	22	0	"	28	0	11	0	"	14	0	6	9	"	9	0
1870	27	0	"	32	6	18	0	"	22	0	8	0	"	14	6
1871	23	0	"	37	0	13	0	"	23	0	11	0	"	16	3
1872	31	6	"	45	0	18	0	"	32	0	12	6	"	18	0
1873	28	0	"	39	0	16	6	"	27	0	7	0	"	16	0
1874	25	0	"	35	0	13	0	"	20	0	7	0	"	14	0
1875	26	6	"	37	6	15	0	"	21	3	9	6	"	17	6
1876	30	0	"	40	0	19	0	"	24	0	13	0	"	20	6
1877	35	0	"	38	9	18	0	"	25	0	13	6	"	23	0
1878	30	0	"	36	0	17	0	"	23	0	12	0	"	22	0
1879	25	0	"	35	9	16	0	"	24	0	10	6	"	20	0
1880	25	0	"	38	0	16	6	"	22	6	10	0	"	17	0
1881	30	0	"	39	0	15	0	"	23	0	10	0	"	15	0
1882	33	0	"	46	0	20	0	"	28	0	12	6	"	18	6
1883	36	0	"	50	6	24	6	"	33	0	14	0	"	21	6
1884	29	0	"	48	6	19	6	"	28	0	12	0	"	19	6
1885	24	0	"	34	0	13	0	"	22	6	10	0	"	15	0
1886	25	0	"	34	0	12	0	"	22	0	10	6	"	16	0
1887	22	0	"	30	0	11	0	"	19	0	8	0	"	13	0
1888	22	0	"	32	0	13	0	"	24	0	10	0	"	15	0
1889	26	0	"	40	0	18	0	"	29	0	13	0	"	22	0
1890	24	0	"	37	0	14	0	"	27	0	10	6	"	19	0
1891	21	0	"	37	0	10	0	"	24	0	7	6	"	15	0
1892	16	0	"	28	6	6	0	"	17	0	3	0	"	10	0
1893	21	0	"	37	0	12	0	"	24	0	7	0	"	14	6
1894	20	0	"	37	6	14	6	"	26	6	8	6	"	16	0
1895	23	0	"	41	0	16	0	"	28	6	9	0	"	17	0
1896	19	0	"	35	4	13	0	"	24	0	6	0	"	13	6
1897	21	0	"	36	6	15	0	"	25	6	7	0	"	14	6
1898	22	0	"	37	0	16	0	"	26	6	8	0	"	15	0

Table No. 3.—PRICE OF WOOL, per stone of 24 lb., since 1818.

Year.	Laid Cheviot.					White Cheviot.				Laid Highland					White Highland.			
	s.	*d.*		*s.*	*d.*	*s.*	*d.*	*s.*	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*	*s.*	*d.*
1818	40	0	to	42	2		..			20	0	to	22	6		..		
1819	21	0	"	22	0		..			10	0	"	10	8		..		
1820	20	0	"	22	0		..			9	0	"	10	0		..		
1821	18	0	"	20	0		..			9	0	"	10	0		..		
1822	12	6	"	14	6		..			5	0	"	6	6		..		
1823	9	0	"	10	6		..			5	0	"	5	9		..		
1824	13	6	"	15	0		..			6	0	"	6	3		..		
1825	10	6	"	22	0		..			10	0	"	10	6		..		
1826	11	0	"	14	0		..			5	0	"	5	6		..		
1827	11	0	"	14	0		..			5	6	"	6	9		..		
1828	8	0	"	11	0		..			5	6	"	6	0		..		
1829	8	6	"	11	0		..			4	3	"	0	0		..		
1830	9	6	"	11	0		..			4	6	"	5	0		..		
1831	17	0	"	20	0		..			7	6	"	8	6		..		
1832	14	0	"	16	0		..			7	0	"	7	6		..		
1833	18	0	"	20	7		..			10	0	"	11	0		..		
1834	21	0	"	24	6		..			5	6	"	7	0		..		
1835	19	0	"	20	6		..			9	6	"	10	8		..		
1836	21	0	"	25	0		..			10	0	"	14	0		..		
1837	12	0	"	14	0		..			7	0	"	7	8		..		
1838	19	0	"	22	6		..			6	0	"	10	0		..		
1839	18	0	"	20	0		..			8	0	"	12	0		..		

TABLE No. 3.—PRICE OF WOOL—*Continued.*

Year.	Laid Cheviot.					White Cheviot.					Laid Highland.					White Highland.				
	s.	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*	*s.*	*d.*		*s.*	*d.*
1840	15	0	to	0	0			..			7	0	to	0	0			..		
1841	15	0	„	16	9			..			6	0	„	7	5			..		
1842	12	6	„	14	0			..			not quoted.							..		
1843	9	0	„	11	6			..			5	0	to	6	0			..		
1844	15	0	„	18	0			..			not quoted.							..		
1845	14	6	„	17	6			..			7	6	to	8	6					
1846	12	0	„	14	6			..			8	0	„	8	6			..		
1847	12	6	„	14	0			..			not quoted.							..		
1848	9	6	„	11	0			..			4	9	to	0	0			..		
1849	12	0	„	16	6			..			6	0	„	6	3			..		
1850	15	0	„	17	6			..			8	0	„	8	6			..		
1851	12	0	„	16	0			..			8	0	„	9	3			..		
1852	13	0	„	15	0			..			8	0	„	9	0			..		
1853	19	0	„	22	0			..			11	0	„	12	6			..		
1854	12	0	„	15	0			..			7	6	„	8	6			..		
1855	14	6	„	19	0			..			8	6	„	9	0			..		
1856	19	0	„	21	6			..			11	0	„	0	0			..		
1857	19	0	„	24	0			..			13	0	„	14	3			..		
1858	15	0	„	17	0			..			8	9	„	10	0			..		
1859	18	6	„	24	0			..			10	9	„	11	6			..		
1860	22	0	„	32	0	37	0	to	38	0	10	0	„	11	3			..		
1861	19	6	„	27	0	from 30s. upwards					not quoted.							..		
1862	18	6	„	26	0	30	0	to	37	0	11	6	to	16	0			..		
1863	25	6	„	31	0	38	0	„	42	0	15	3	„	17	6			..		
1864	31	0	„	39	0	47	0	„	54	0	17	6	„	20	0			..		
1865	28	0	„	30	0	44	0	„	45	0	15	0	„	17	0			..		
1866	24	0	„	30	0	30	0	„	38	0	14	0	„	16	0			..		
1867	16	0	„	21	6	not quoted.					not quoted.							.		
1868	19	0	„	26	0	28	0	to	32	0	8	6	to	9	0			..		
1869	18	0	„	26	6	not quoted.					8	6	„	10	0			..		
1870	15	0	„	23	6	25	0	to	26	0	9	6	„	0	0			..		
1871	20	0	„	26	6	30	0	„	34	6	12	0	„	15	0			..		
1872	26	0	„	37	6	40	0	„	48	0	18	0	„	21	0			..		
1873	17	0	„	18	0	34	0	„	40	0	9	0	„	12	0			.		
1874	18	6	„	26	6	30	0	„	34	0	9	6	„	13	0			..		
1875	25	0	„	32	0	34	6	„	36	0	12	6	„	16	0			..		
1876	20	0	„	24	0	30	0	„	34	6	9	6	„	12	0			..		
1877	20	9	„	26	0	28	0	„	30	0	10	0	„	12	0			..		
1878	18	9	„	25	0	27	0	„	32	0	8	6	„	11	6			..		
1879	15	0	„	17	0	prices very low.					7	0	„	0	0			..		
1880	20	0	„	24	0	30	0	to	32	0	10	6	„	11	6	14	0	to	15	0
1881	17	0	„	21	0	27	0	„	30	0	5	0	„	9	6	12	0	„	13	0
1882	14	0	„	18	0	27	6	„	28	0	7	6	„	9	0	13	0	„	14	0
1883	13	0	„	18	0	26	0	„	28	0	6	6	„	8	6	11	6	„	12	6
1884	13	0	„	18	0	26	0	„	28	0	6	6	„	8	6	11	6	„	12	6
1885	12	0	„	17	0	22	6	„	26	0	6	0	„	8	0	11	6	„	12	0
1886	13	0	„	18	0	23	0	„	27	6	6	6	„	8	6	11	6	„	12	0
1887	14	0	„	22	0	23	0	„	28	0	7	0	„	9	0	11	6	„	13	0
1888	13	0	„	20	0	23	0	„	28	0	7	0	„	9	0	11	0	„	12	6
1889	13	0	„	18	0	24	0	„	28	0	7	0	„	9	0	11	0	„	12	6
1890	13	0	„	18	0	24	0	„	28	0	7	0	„	9	0	11	0	„	12	6
1891	12	6	„	18	0	22	0	„	28	0	7	0	„	9	0	11	0	„	12	6
1892	12	0	„	18	0	20	0	„	28	0	7	0	„	8	6	10	6	„	12	0
1893	12	0	„	17	0	20	0	„	27	0	7	0	„	8	0	10	0	„	12	0
1894	12	0	„	16	0	20	0	„	26	0	7	0	„	8	0	10	0	„	12	0
1895	12	0	„	16	0	20	0	„	25	0	7	0	„	8	0	10	0	„	11	6
1896	11	0	„	15	0	19	0	„	24	0	7	0	„	8	0	10	0	„	11	6
1897	11	0	„	14	0	18	0	„	23	0	7	0	„	8	0	10	6	„	12	0
1898	10	0	„	13	0	16	0	„	20	0	7	0	„	8	0	10	0	„	11	6

GENERAL SHOW AT KELSO, 1898.

THE seventy-first Show of the Society was held at Kelso on the 5th, 6th, 7th, and 8th of July 1898. It was the fifth which has taken place at Kelso, and was one of the most successful that has been held in the Border counties. The Town Commissioners of Kelso rented Springwood Park for the year, and gave the Society the use of it for a showyard entirely free of charge. A delightful showyard it made, ample in extent, level and firm on the surface, and charmingly situated.

In addition to providing the showyard the Town of Kelso gave a free supply of water, contributed a sum of £300 towards the funds of the Show, and in every way co-operated most heartily with the Society in promoting the success of the meeting. As will be seen from the accounts of the Show, in another part of this volume, the funds of the Show were likewise most handsomely supported by the counties of Berwick, Roxburgh, Peebles, and Selkirk, the county councils of which contributed £869, raised by means of a voluntary assessment. Then the Border Union and the Berwickshire Agricultural Society both contributed, the former giving the very large sum of £200. The local fund amounted in all to £1379, 13s. 6d.

The weather was wet and stormy on the opening day, dull and threatening on the second day, but on the last two days it was all that could have been desired. On Wednesday, probably owing to the unfavourable appearance of the weather in the morning, the attendance of the public was surprisingly small, but alike on Thursday and Friday it was comparatively large.

The balance-sheet of the Show reads more agreeably than had been anticipated. The expenditure exceeded the receipts by about £353, which compares favourably with an adverse balance of £728 at the Melrose Show of 1889, and of £1456 at the Kelso Show of 1880.

The Premium List arranged for the Show was an exceptionally liberal one. The Society's premiums amounted to £2479, and special prizes by various donors raised the sum to about £2875. This exceeds the sum offered at Melrose in 1889 by over £600.

The display of live stock well maintained the high character of the Highland Show. In the sections of horses and cattle it was smaller, but in the sheep classes it was larger, than at Glasgow in 1897. In regard to general merit it was little if anything behind the exceptionally high level attained at that fine Show. In the Border counties a great show of sheep is always

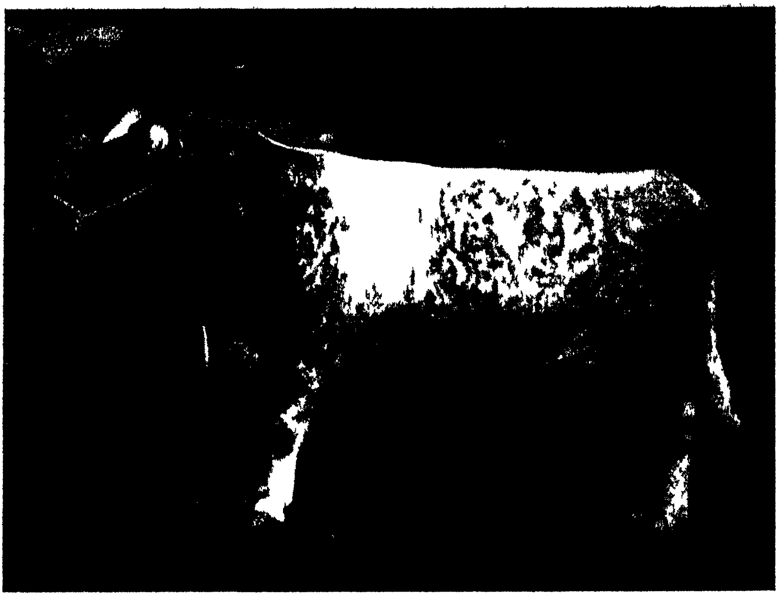


Fig. 80.—Shorthorn Bull, “Star of Dawn.”

Winner of President's Medal for best Shorthorn, Kelso Show, 1898 The property of Mr C. Home Graham Stirling of Strowan, Crieff Bred by Mr A M Gordon of Newton, Inch, Aberdeenshire Age two years and two months

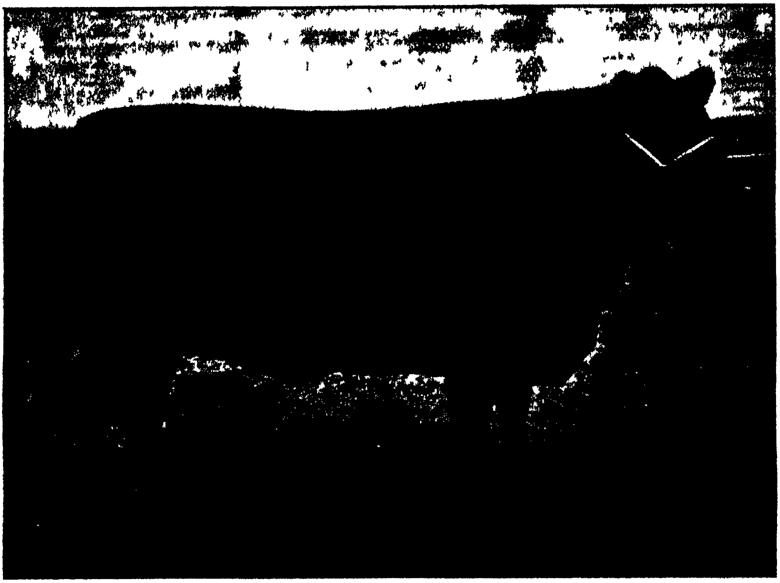


Fig. 81.—Aberdeen Angus Heifer, “May of Glamis” 24,827

Winner of President's Medal for best animal of the breed, Kelso Show, 1898 Bred by and the property of the Earl of Strathmore, Glamis Castle, Glamis Age two years and four months expected, and rarely has a better collection of sheep been seen in any showyard than was penned at Kelso on this occasion.

In the Implement department of the Show there was a large, varied, and high-class display. Business was on the whole fairly encouraging to the makers of improved labour-saving implements and machines.

Statistics.

The following tables give the number of entries in the various sections:—

1. CATTLE.

Class.		No. of Entries.	
	SHORTHORN.		
1.	Aged bulls	7	
2.	Two-year-old bulls	19	
3.	One-year-old bulls	17	
4.	Cows of any age	6	
5.	Two-year-old heifers	10	
6.	One-year-old heifers	14	
		—	73
	ABERDEEN-ANGUS.		
7.	Aged bulls	11	
8.	Two-year-old bulls	7	
9.	One-year-old bulls	5	
10.	Cows of any age	9	
11.	Two-year-old heifers	5	
12	One-year-old heifers	20	
		—	57
	GALLOWAY.		
13.	Aged bulls	2	
14.	Two-year-old bulls	2	
15.	One-year-old bulls	4	
16.	Cows of any age	8	
17.	Two-year-old heifers	6	
18	One-year-old heifers	11	
		—	33
	HIGHLAND.		
19.	Aged bulls	6	
20	Two-year-old bulls	4	
21.	One-year-old bulls	6	
22	Cows of any age	8	
23	Three year-old heifers	7	
24	Two-year-old heifers	7	
		—	38
	AYRSHIRE.		
25.	Aged bulls	1	
26.	Two-year old bulls	3	
27.	One-year-old bulls	10	
28.	Cows in milk, calved before 1895	4	
29.	Cows in milk, calved in 1895	2	
30.	Cows of any age, in calf, or heifer, calved in 1895	3	
31.	Two-year-old heifers	5	
32.	One-year-old heifers	9	
		—	37
	Extra cattle		6
			244

Fig 82 —Galloway Heifer, "Louisa 2nd of Durhamhill" 14,925

Winner of President's Medal for best Galloway Kelso Show 1898 Bred by and the property of Mr John Cunningham, Durhamhill, Dalbeattie Age two years and three months

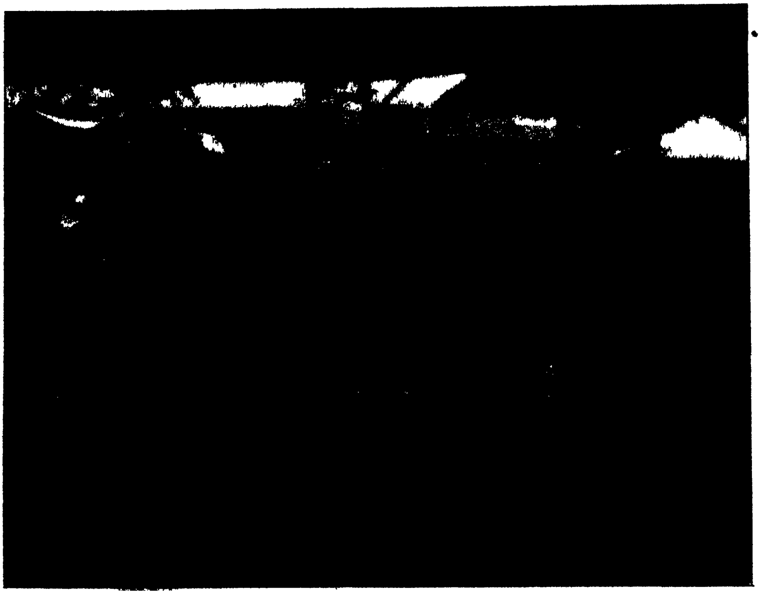


Fig 83 —Highland Bull, "Calum Riabhach II"

Winner of President's Medal for best animal of the breed, Kelso Show 1898 Bred by and the property of the Duke of Atholl K T Blair Castle Blair Atholl Age two years and three months

2. HORSES.

DRAUGHT STALLIONS.

33.	Aged stallions	13	
34.	Three-year-old entire colts	10	
35.	Two-year-old entire colts	19	
36.	One-year-old entire colts	18	
		—	60

DRAUGHT GELDINGS.

37.	Aged geldings	5	
38.	Three-year-old geldings	7	
39.	Two-year-old geldings	9	
		—	21

DRAUGHT MARES AND FILLIES.

40.	Mares with foal at foot	11	
41.	Yeld mares	9	
	Extra stock	1	
42.	Three-year-old fillies	16	
43.	Two-year-old fillies	17	
44.	One-year-old fillies	14	
		—	68

HUNTERS.

45.	Colt, gelding or filly, foaled in 1897, the produce of thoroughbred stallions	11	
46.	Mare or gelding for field, foaled in 1896	10	
47.	Mare or gelding for field, foaled in 1895	5	
48.	Hunter, mare or gelding, foaled in 1894, able to carry over 14 stone	3	
49.	Hunter, mare or gelding, foaled 1894, able to carry from 12 to 14 stone	6	
50.	Hunter, mare or gelding, foaled before 1st Jan. 1894, able to carry over 14 stone	5	
51.	Hunter, mare or gelding, foaled before 1st Jan. 1894, able to carry from 12 to 14 stone	3	
52.	Hunter, brood mare, with foal at foot	5	
		—	48

HACKNEYS.

53.	Brood mares, 15 hands and upwards, with foal at foot, or to foal this season to a registered sire	3	
54.	Brood mares, under 15 hands, with foal at foot, or to foal this season to a registered sire	2	
55.	Fillies, three years old	5	
56.	Fillies, two years old	5	
57.	Fillies, one year old	4	
58.	Stallions, foaled in or before 1895, over 15 hands	No entry.	
59.	Stallions, foaled in or before 1895, over 14 and not over 15 hands	3	
60.	Entire colts, two years old	2	
61.	Entire colts, one year old	5	
		—	29

ROADSTERS.

62.	Roadster, mare or gelding, foaled before 1st Jan. 1895, 15 hands and upwards	6	
63.	Roadster, mare or gelding, foaled before 1st Jan. 1895, 14.2 and under 15 hands	4	
		—	10

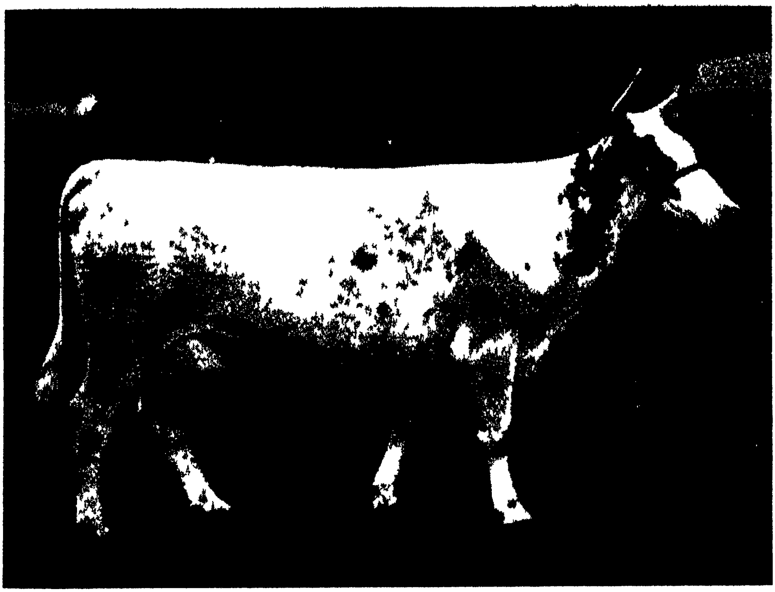


Fig 84 —AYRSHIRE COW, "CHERRY RIPE"

Winner of President's Medal for best Ayrshire Kelso Show 1898 The property of Messrs R & J M'Alister, Mid Ascog, Rothesay Bred by Mr John Bauchop, Auchentilloch, Alexandria Age four years

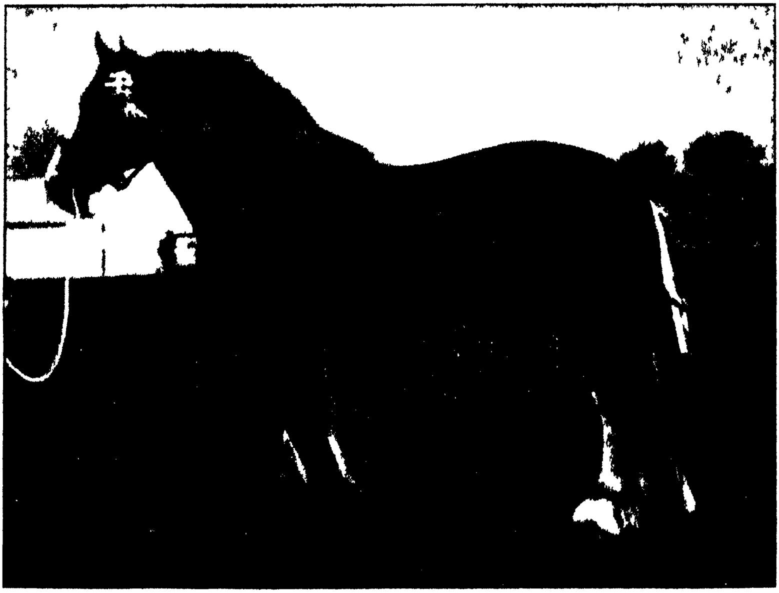


Fig 85 —CLYDESDALE STALLION, "BENEDICT" 10,315

Winner of President's Medal for best Clydesdale Stallion Kelso Show 1898 The property of Messrs W & A Montgomery, Netherhall and Banks Kirkcudbright Bred by Mr W Marshall, Lochfergus Age two years and one month

PONIES.

64.	Stallions, 3 years old and upwards, over 12 and not exceeding 14 hands	1	
65.	Mares or geldings, 3 years old and upwards, over 13 and not over 14½ hands	5	
66.	Mares or geldings, 3 years old and upwards, over 12 and not over 13 hands	5	
67.	Stallion, 3 years old and upwards, 12 hands and under	No entry.	
68.	Mares or geldings, 3 years old and upwards, 12 hands and under	1	
69.	Shetland stallions, not exceeding 10½ hands, foaled before 1st Jan. 1895	4	
	Extra stock	1	
70.	Shetland mares, not exceeding 10½ hands, with foal at foot	6	
71.	Shetland mare or gelding, not exceeding 10½ hands, foaled before 1st Jan. 1896	9	
		—	32

DRIVING COMPETITIONS.

72.	Best horse in harness, 15 hands and upwards (3)	1	
73.	Best horse in harness, under 15 hands (7).		
74.	Best tandem turn-out (4).		
		—	1
			269

3. SHEEP.

BLACKFACED.

75.	Tups above one shear	14	
76.	Shearling tups	24	
77.	Ewes above one shear, with lambs	8	
78.	Shearling ewes or gimmers	13	
		—	59

CHEVIOT.

79.	Tups above one shear	19	
80.	Shearling tups	26	
81.	Ewes above one shear, with lambs	9	
82.	Shearling ewes or gimmers	13	
		—	67

BORDER LEICESTER.

83.	Tups above one shear	16	
84.	Shearling tups	46	
85.	Ewes above one shear	7	
86.	Shearling ewes or gimmers	25	
		—	94

HALF-BRED.

87.	Tups above one shear	10	
88.	Shearling tups	22	
89.	Ewes above one shear	12	
90.	Shearling ewes or gimmers	22	
91.	Three ewe lambs	9	
		—	75

SHROPSHIRE.

92.	Tups above one shear	1	
93.	Shearling tups	11	
94.	Ewes above one shear	5	
95.	Shearling ewes or gimmers	8	
		—	25

OXFORD DOWNS.

96.	Shearling tups	7	
97.	Shearling ewes or gimmers	7	
		—	14

Fig. 86 —Draught Gelding, "Masterpiece"

Winner of Presidents Medal for best Draught Gelding Kelso Show, 1898 The property of Messrs James Young & Sons, Edinburgh Bred by Messrs Gass, Howgillside, Annan Age four years

Fig 87 —Clydesdale Mare, "Montrave Maud" 11,786

Winner of Presidents Medal for best Clydesdale Mare or Filly, Kelso Show, 1898 Bred by and the property of Sir John Gilmour, Bart, of Montrave, Leven, Fife. Age nine years

SUFFOLK.

98.	Tups, any age		7

EXTRA SECTIONS.

99.	Three blackfaced wethers, one shear	5	
100.	Three Cheviot wethers, one shear	5	
101.	Three shearling wethers, any cross	5	
102.	Fat lambs, any breed or cross	9	
		—	24
	Extra sheep		1
			366

4. WOOL.

103.	Blackface wether wool	2	
104.	Blackface ewe wool	11	
105.	Blackface ewe or wether hogg wool	11	
		—	24

5. SWINE.

106.	Boars, large white breed	3	
107.	Sows, large white breed	5	
108.	Pigs not above 8 months old, large white breed	5	
109.	Boars, white breed other than large	3	
110.	Sow, white breed other than large	No entry.	
111.	Pigs not above 8 months old, white breed other than large	2	
112.	Boars, Berkshire breed	2	
113.	Sows, Berkshire breed	2	
114.	Pigs not above 8 months old, Berkshire breed	2	
	Extra stock	1	

6. POULTRY.

1 80	Poultry		335

7. DAIRY PRODUCE.

1.	Cured butter	9	
2.	Powdered butter	9	
3.	Fresh butter	15	
4.	Cheddar cheese, 56 lb. and upwards	5	
		—	38

8. HORSE-SHOEING.

1.	Draught-horses	10	
2.	Roadsters	11	
		—	21

ABSTRACT.

		No. of Entries
1.	Cattle	244
2.	Horses	269
3.	Sheep	366
4.	Wool	24
5.	Swine	25
6.	Poultry	335
7.	Dairy produce	38
8.	Horse-shoeing	21

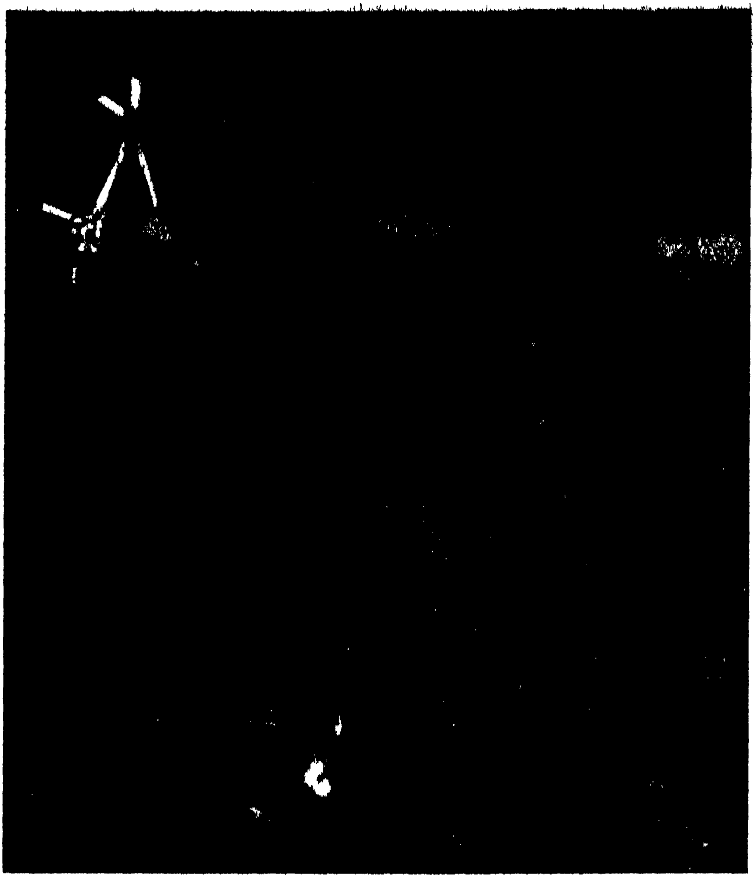
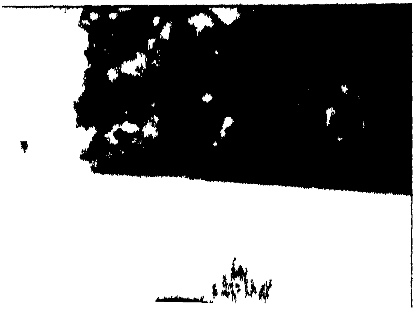


Fig 98.—Hunter Colt, "Julius."

Winner of President's Medal for best animal in Hunter Classes, Kelso Show 1898. Bred by and the property of Mr David Mitchell, Millfield, Polmont. Age one year.



The following table gives a comparative view of the entries of cattle, horses, sheep, swine, poultry, dairy produce, and implements, of the value of the premiums offered, and of the receipts at the entrance-gates, grand stands, and for catalogues at the Shows which have been held in the Border District:—

Year and Place.	Cattle.	Horses.	Sheep.	Swine.	Poultry.	Dairy Produce.	Horse-shoeing.	Implements.	Premiums.	Receipts.
1832, Kelso .	88	18	89	16	...	...	...	11	£530	£129
1841, Berwick	175	96	209	25	...	...	...	60	1050	410
1854, Do.	179	141	358	54	87	...	...	357	1500	805
1863, Kelso .	245	127	276	49	87		...	1101	1300	1423
1872, Do. .	274	214	269	36	216	..	...	1777	1888	2171
1880, Do. .	275	226	224	23	202	...	...	1578	2671	1664
1889, Melrose	271	243	290	42	220	51	..	1288	2276	2214
1898, Kelso .	244	270	366	25	335	38	21	1933	2855	2196

Cattle.

The statistics show that all the standard breeds of cattle were well represented as to numbers. Seldom, indeed, has the average standard of merit been higher than it was on this occasion.

As in 1897, the Shorthorn breed had the largest number of entries. In regard to merit it was very creditably represented. The President's medal for the best animal of the breed went to Mr C. Home Graham Stirling of Strowan, Crieff, for "Star of Dawn" (fig. 80), an attractive two-year-old roan, bred by Mr A. M. Gordon of Newton, Aberdeenshire, got by the valuable sire "Star of the Morning" 58,189, and out of "Marian," a cow sired by Mr Gordon's famous champion bull "Mario" 51,713. "Star of Dawn" is well shaped, and shows excellent quality and character. He of course was leading winner in the class of two-year-old bulls, which was a very strong one, containing no fewer than nineteen entries. Nine entries made up a good class of adult Shorthorn bulls, the first prize going to Lord Polwarth for his handsome white bull "Border Reiver" 68,254, bred by his lordship and got by the Booth bull "Sir Lucius Studley" 64,852. Yearling Shorthorn bulls also formed a large class, including several animals of unquestionably high merit. A bull from across the Border came to the front here, a well-balanced bull of much promise, named "Ingram's Style," shown by Mr John Handley, Green Head, Milnthorpe, Westmoreland, bred by Messrs Taylor & Walton, Hall Garth, near Penrith, and got by "Dunnottar" 68,554. There was a small but good class

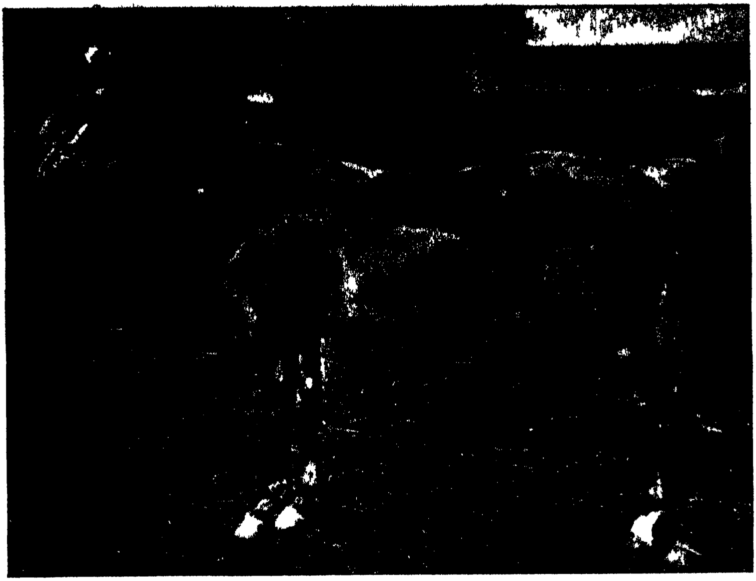


Fig 90 —Hackney Mare, "Gold Lace" 8915

Winner of President's Medal for best Roadster Kelso Show 1898 Bred by and the property of Mr Henry Liddell Grainger Ayton Castle, Ayton Age four years

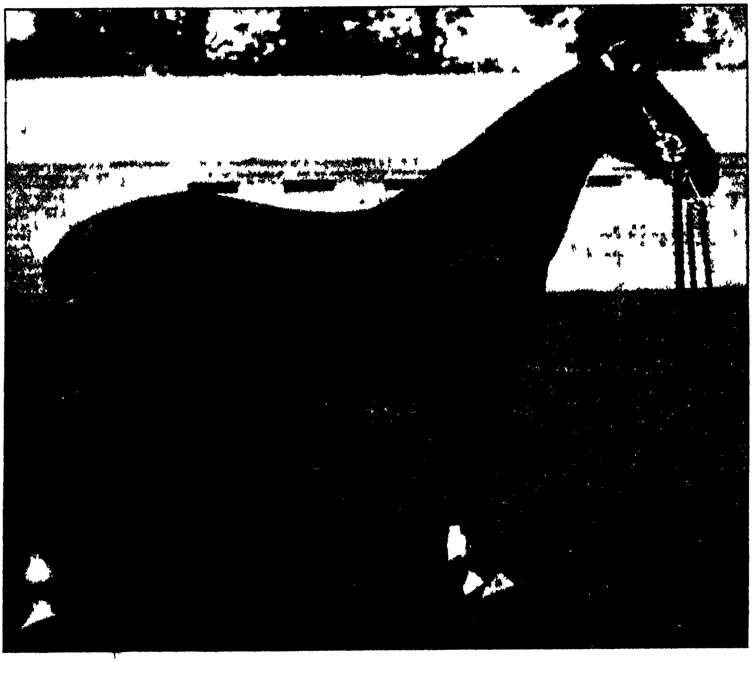


Fig 91 —Pony Mare, "Inholmes Princess" 8997

Winner of President's Medal for best Pony Kelso Show, 1898 The property of Messrs W & J Thomson, Richmond House Dullatur Bred by Mr T Mitchell, Eccleshill of Shorthorn cows, while both the Shorthorn heifer classes were creditably filled.

Although far from their "native heath," Aberdeen-Angus cattle made a capital appearance both as to numbers and merit. The President's Champion medal here went to the Earl of Strathmore for "May of Glamis" 24,827 (fig. 81), an exceptionally thick, level, heavily-fleshed two-year-old heifer, fine in the bone and of choice quality, but a trifle short in the frame. She was bred by his lordship, got by "Siberian" 5720, and out of "May 23rd" 21,079. The bull classes of this breed were well filled, especially the class of old bulls, in which there were eleven entries. The first prize here went to an English breeder, Mr C. Bolden, Preston Bisset, Buckingham, for "Proud Duke of Ballindalloch" 12,031. This handsome bull, as his name suggests, was bred at Ballindalloch Castle, his sire having been the well-known prize bull "Prince Inca" 7844. He won the Ballindalloch Challenge Cup for the best male of the breed, and was marked as "reserve" for the President's medal. The younger bull classes were not large, but the standard of merit was highly satisfactory. The class of cows contained nine entries, but it has occasionally shown greater excellence. The first prize and the Ballindalloch Challenge Cup went to Mr George Willsher, Pitpointie, Dundee, for "Blooming Rose" 21,278, a well-formed cow of a useful stamp, bred by himself, got by "Adolphus" 8037, and out of "Rosebud of Pitpointie" 15,820. Lord Strathmore not only headed the class of two-year-old heifers (with "May of Glamis"), but also carried the second prize, the winner of this honour being "Estelle" 24,824, another valuable heifer of his own breeding, and got by "Siberian" 5720. As often happens, the class of yearling Aberdeen-Angus heifers was the largest in the cattle section of the Show.

Galloway cattle were few in number, but nothing was wanting in regard to merit. The winner of the President's Champion medal in this section was again Mr John Cunningham, Durhamhill, Dalbeattie, who attained this high honour both in 1897 and 1896. His victorious animal at Kelso was "Louisa 2nd of Durhamhill" 14,925 (fig. 82), an attractive two-year-old heifer of his own breeding, got by "Camp-follower" 5042, and out of Dora 4th of Tarbreoch" 11,996. The "reserve" animal was Mr Cunningham's handsome cow "Maggie Lauder of Durhamhill" 13,994, a handsome four-year-old, which headed a very good class of cows. The classes of Galloway bulls were small, but they included two or three animals of decidedly high merit. Yearling heifers made a specially strong class.

The classes of Highland cattle were all fairly well filled. The breed was, on the whole, admirably represented. The Duke of Atholl's champion two-year-old bull "Calum Riabhach II." (fig.

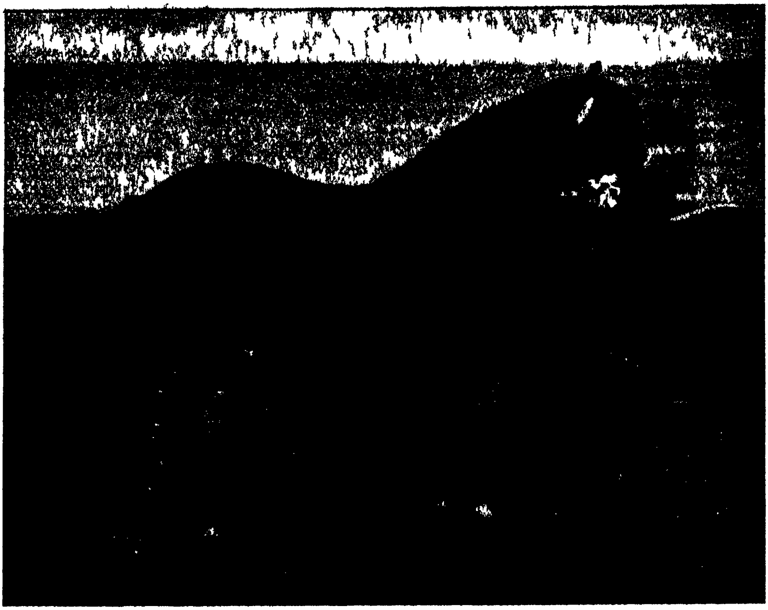


Fig 92 —Shetland Pony Mare, Bretta 811

Winner of President's Medal for best Shetland Pony Kelso Show 1898 Bred by and the property of the Marquis of Londonderry K G Age ten years

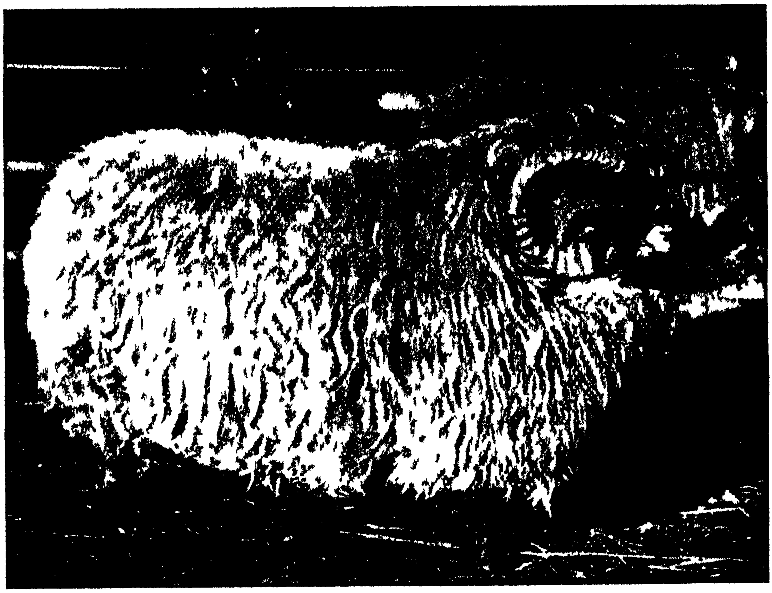


Fig 93 —Blackfaced Tup

Winner of President's Medal for best animal of the breed Kelso Show 1898 Bred by and the property of Mr James Archibald Overshiels Stow

83) was much admired for his handsome shape and fine character. He was bred by his Grace, got by "Valentine V." 1062, and out of "Donnag Riabhach" 2552.

Similar remarks apply to Ayrshire cattle. Large classes so far from the home of the breed were not looked for, but in regard to merit the good name of the Ayrshire was well maintained. The President's Champion medal here went to Messrs R. & J. M'Alister, Mid Ascog, Rothesay, for their first-prize cow "Cherry Ripe" (fig. 84), a handsome four-year-old white, bred by Mr John Bauchop, Auchentilloch, Alexandria, and got by "Loudonhill Lad."

Horses.

Not often has there been at the Highland Show a better representation of Clydesdale horses than there was at Kelso. The classes were all well filled as to numbers, and as regards general merit the display was decidedly above the average of recent years. Again, as at Glasgow, Messrs A. & W. Montgomery won the President's medal for the best Clydesdale stallion or colt with their first-prize winner in the class for two-year-old colts. Their champion on this occasion was "Benedict" 10,315 (fig. 85), a strong stylish bay, with good action and quality and much promise, bred by Mr W. Marshall, Lochfergus, Kirkcudbright, got by the well-known sire "Baron's Pride" 9122, and out of the "Macgregor" mare "Mary Macgregor" 12,864. In a very strong class of aged stallions Messrs Montgomery won the first prize with that valuable horse "Montrave Sentinel" 10,094, bred by Sir John Gilmour, and got by "Prince of Albion" 6178. The class of yearling colts was very creditably filled.

Draught geldings were few in number, but quite equal to the high standard of recent years. Messrs James Young & Sons won the President's medal for the best draught gelding with "Masterpiece" (fig. 86), a handsome four-year-old brown, bred in the Annan district, and got by "Lyon of Purdieston."

The classes of Clydesdale mares and fillies were wonderfully uniform in numbers and merit, and of a highly satisfactory character all through. Sir John Gilmour's grand mare "Montrave Maud" 11,786 (fig. 87) made a worthy winner of the President's Champion medal for the best Clydesdale mare or filly. The Cawdor Cup went to the same famous mare, the "reserve" in both cases being Mr Dunlop's well-known mare "Mary Kerr."

The display of hunting horses was disappointingly small for the district. There was a fairly good turn-out of yearlings and two-year-olds, but the classes of adult hunters were poorly filled. The President's medal for the best animal in the hunting classes

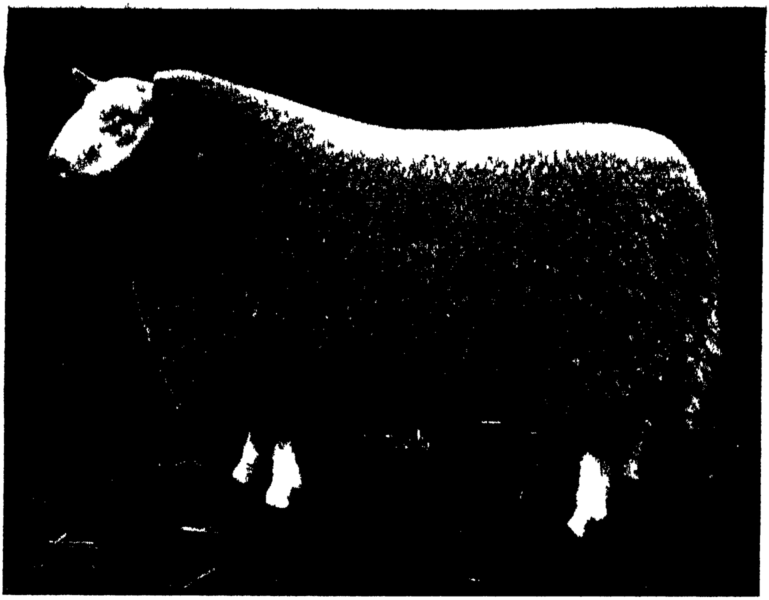


Fig 94 —Cheviot Tup

Winner of President's Medal for best animal of the breed, Kelso Show 1898 Bred by and the property of Mr John Elliot Hindhope Jedburgh

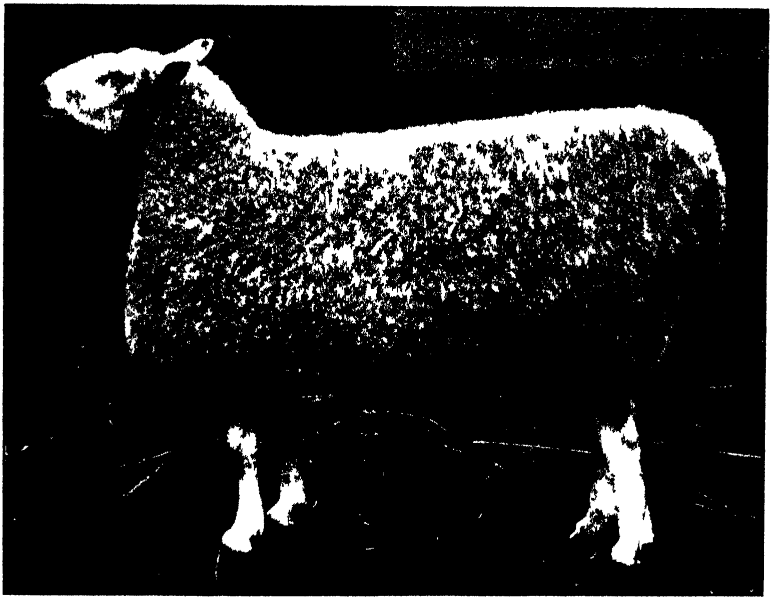


Fig 95 —Border Leicester Tup

Winner of President's Medal for best animal of the breed Kelso Show 1898 The property of Mr Matthew Templeton Drumore, Kirkcudbright Bred by Mr John Twentyman Hawkrigg House Wigton went to Mr David Mitchell, Millfield, Polmont, for a handsome yearling colt named "Julius" (fig. 88), bred by himself, got by "Charles Edward," and out of "Julia" by "Janus."

The entries of Hackneys were also few in number, but in regard to merit the breed was fairly well represented. Mr M. Wray, Register Square, Beverley, won the President's medal for the best Hackney with his stylish four-year-old stallion "Windsor" 5864 (fig. 89), bred by himself, got by "His Majesty" 2513, and out of "Wood Violet" 2511 by "Lord Derby 2nd" 417, Mr C. E. Galbraith's well-known filly "Trilby" 10,568 being marked as "reserve" for that honour. The Hackney Horse Society's Gold Medal for best mare or filly in the Hackney or Pony classes as usual gave rise to an interesting contest, the winner being Messrs W. & J. Thomson's valuable four-year-old chestnut mare "Inholmes Princess" 8997 (fig. 91), bred by Mr T. Mitchell, Eccleshill, Bradford, got by "Lord Hamlet" 3750, and out of "Inholmes Queen" 5419 by "Connaught" 1453.

The classes for roadsters were small, but contained a few very good animals, the President's Champion medal going to Mr Liddell-Grainger's attractive Hackney mare "Gold Lace" 8945 (fig. 90), bred by himself, got by "Goldfinder 6th" 1791, and out of "Lady Derby" 2890 by "Lord Derby 2nd" 417. The pony classes unfortunately were not so well filled as usual, but the leading winners were all deserving of the honours they obtained. Messrs Thomson's fine mare "Inholmes Princess" 8997 (fig. 91), already referred to, could not be denied the President's medal for the best pony.

Shetland ponies, although few in number, as usual formed a most interesting feature in the Show. The Marquis of Londonderry's mare "Bretta" (fig. 92), which won the President's medal, is an exceptionally handsome ten-year-old black, bred by his lordship, got by "Odin" 32, and out of "Beauty" 167.

Sheep, &c.

As was expected in the Border district, the collection of Sheep formed perhaps the strongest feature in the Show. The entries of all the leading breeds were numerous, and in regard to character the display was highly meritorious. It will be seen from the particulars under figs. 93 to 99, that all the winners of the President's medals in the Sheep classes, excepting the champion Border Leicester, were bred by the exhibitors.

Although the show of Swine was small, it contained several animals of excellent breeding and choice merit. Mr Sanders Spencer won the President's medal with "Holywell Model"

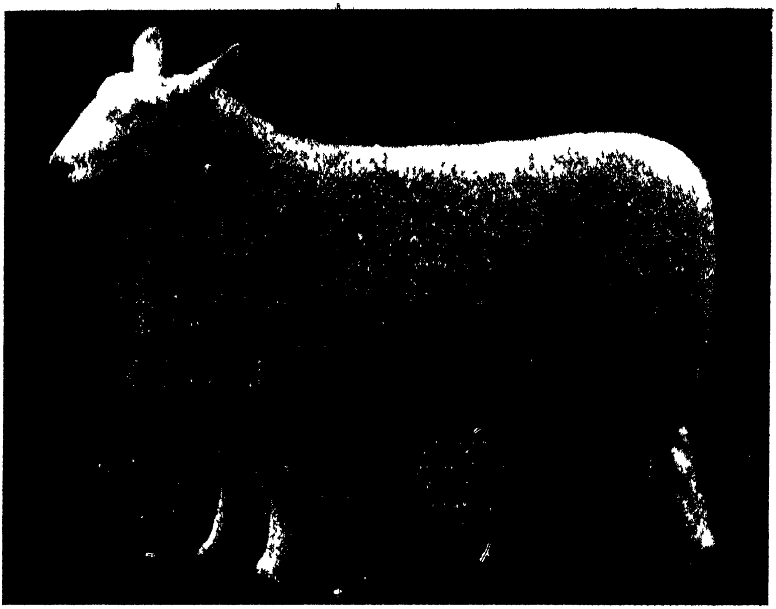


Fig 96.—Half Bred Tup.

Winner of President's Medal for best animal of the breed Kelso Show, 1898 Bred by and the property of Mr Robert Dickinson, Longcroft, Lauder.

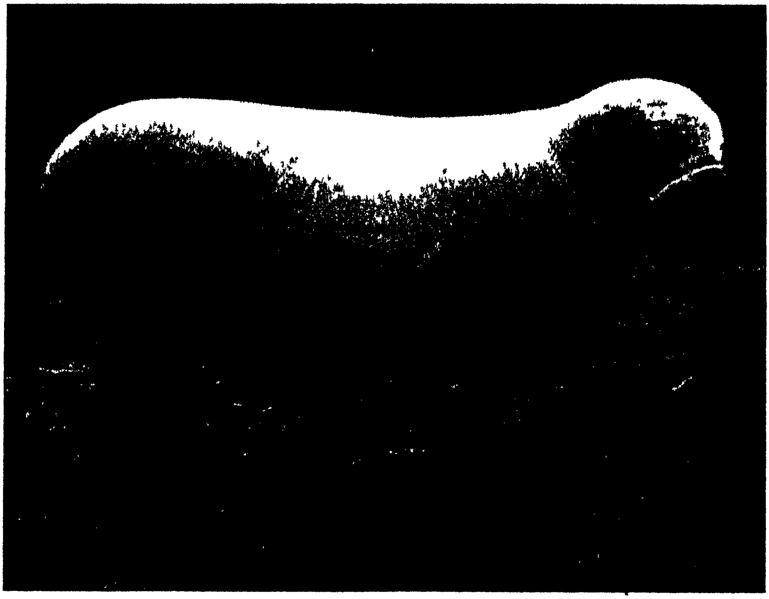


Fig. 97.—Shropshire Tup.

Winner of President's Medal for best animal of the breed, Kelso Show, 1898. Bred by and the property of Mr David Buttar, Corston, Coupar-Angus

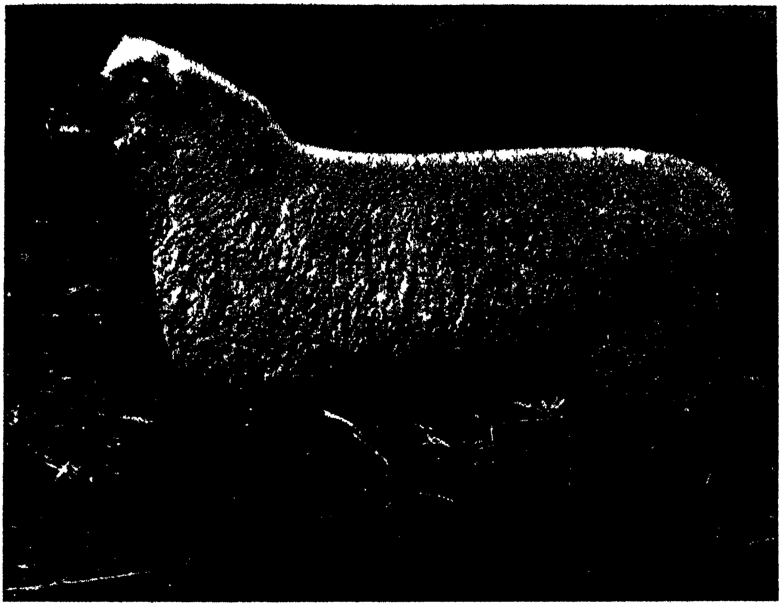


Fig 98.—Oxford Down Tup.

Winner of President's Medal for best animal of the breed, Kelso Show, 1898 Bred by and the property of the Right Hon. Arthur James Balfour, M.P., Whittinghame Prestonkirk.

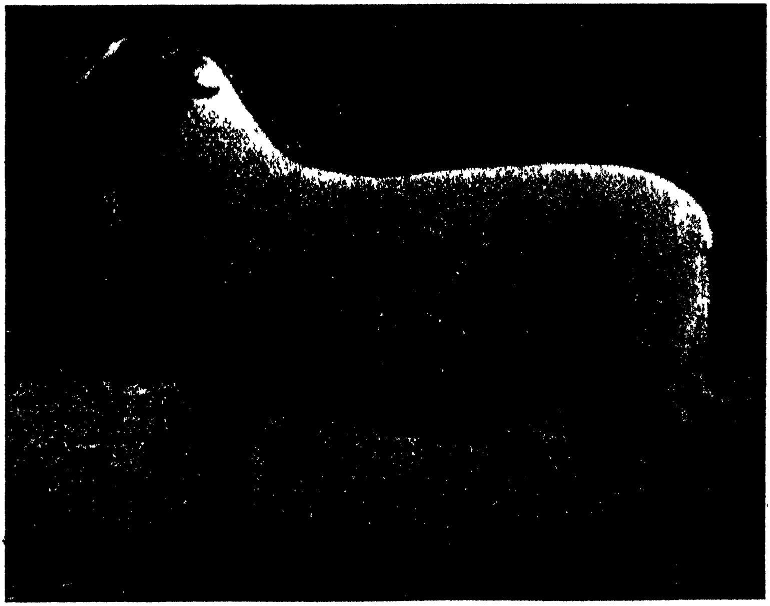


Fig. 99.—Suffolk Tup.

Winner of President's Medal for best animal of the breed, Kelso Show, 1898. Bred by and the property of the Earl of Ellesmere, Stetchworth Park, Newmarket.

(fig. 100), an exceptionally handsome sow of the Large White breed, five years old, and bred by himself.

The collection of fleeces of Blackface Wool was smaller than at Glasgow, yet it was fairly large and interesting. The list of classes and prizes for Poultry were revised for the Kelso Show, but the increase in the number of entries was not quite so large as had been anticipated. There was a small but creditable display of Butter and Cheese.

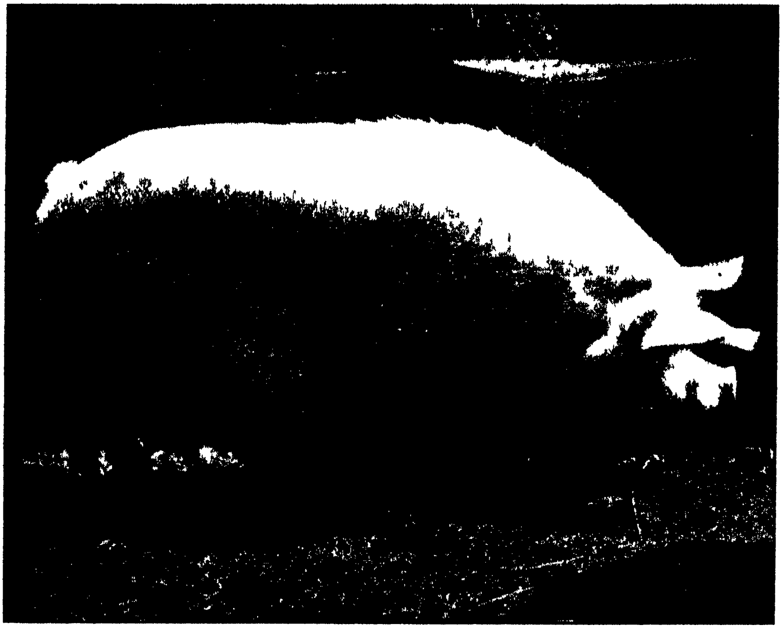


Fig. 100.—Large White Sow, "Holywell Model."

Winner of President's Medal for best Pig, Kelso Show, 1898. Bred by and the property of Mr Sanders Spencer, Holywell Manor, St Ives, Hunts.

PREMIUMS AWARDED BY THE SOCIETY IN 1898

I.—PROFESSOR W. OWEN WILLIAMS, Edinburgh, for Apparatus for Measuring Height of Horses—Medium Gold Medal.

II.—KELSO SHOW

5th, 6th, 7th, and 8th July 1898

ABBREVIATIONS.—V.H.C., *Very Highly Commended.* H.C., *Highly Commended.* C., *Commended.*

CATTLE

SHORTHORN.

PRESIDENT'S MEDAL for best Shorthorn.

No. 26. C. Home Graham Stirling of Strowan, Crieff, "Star of Dawn."

For best Shorthorn Bull in Classes 1, 2, *and* 3—£20, given by the Shorthorn Society.

No. 26. C. Home Graham Stirling of Strowan, Crieff, "Star of Dawn."

Breeder of best Bull of any age in Classes 1, 2, *and* 3—Silver Medal.

No. 26. A. M. Gordon of Newton, Insch.

CLASS 1. BULL, calved before 1st January 1896.—Premiums, £15, £10, £5, and £3.

1st. No. 5. Lord Polwarth, Mertoun House, St Boswells, "Border Reiver" (68,254).
2nd. No. 2. John Handley, Green Head, Milnthorpe, "Prince of the North" (71,256).
3rd. No. 6. Robert Taylor, Pitlivie, Carnoustie, "Brilliant" (68,288).
4th. No. 3. George Harrison, The Hall, Gainford, Darlington, "Cornelius" (66,864).
V.H.C. No. 1. Walter Elliot, Pitcox, Dunbar, "Agricola."

CLASS 2. BULL, calved in 1896.—Premiums, £15, £10, £5, and £3.

1st. No. 26. C. Home Graham Stirling of Strowan, Crieff, "Star of Dawn."
2nd. No. 17. George Harrison, The Hall, Gainford, Darlington, "Misty Morning" (71,021).
3rd. No. 15. Sir John Gilmour of Montrave, Bart., Leven, "Brave Archer" (70,018).
4th. No. 16. John Handley, Green Head, Milnthorpe, "Bapton Robin" (69,908).
V.H.C. No. 22. James Milne, jun., Nether Cairnhill, Muchalls, "Murillo" (71,054).
H.C. No. 21. George Longmore, Rettie, Banff, "Prince of Rettie" (71,248).
C. No. 11. G. G. Clarke, Meddat, Parkhill, "Faultless."

CLASS 3. BULL, calved in 1897.—Premiums, £12, £8, £4, and £2.

1st. No. 28. John Handley, Green Head, Milnthorpe, Westmoreland, "Ingram's Style."
2nd. No. 37. Messrs Peterkin, Dunglass, Conon Bridge, N.B., "Merry Hampton."

3rd. No. 33. James M'William, Stoneytown, Keith, "Pride of Fame."
4th. No. 29. George Harrison, The Hall, Gainford, Darlington, "Count Beauty."
V.H.C. No. 43. Robert A. Yerburgh, M.P., Woodfold Park, Blackburn, "Silky Prince."
H.C. No. 32. Donald Maclennan, 42 Sackville Street, Piccadilly, London, W., "Merry Merlin."
C. No. 36. Charles Munro, Mains of Murthly, Aberfeldy, "Prince Charlie."

CLASS 4. COW, of any age.—Premiums, £12, £8, £4, and £2.

1st. No. 48. C. Home Graham Stirling of Strowan, Crieff, "Strowan Marchioness 3rd."
2nd. No. 44. George Harrison, The Hall, Gainford, Darlington, "Rose Blossom."
3rd. No. 49. James Watt, Knowefield, Carlisle, "Lothian Brilliant."
4th. No. 46. Captain W. J. Oliver, Hoselaw, Kelso, "Lady Terrona."
V.H.C. No. 45. Captain W. J. Oliver, Hoselaw, Kelso, "Maud."
H.C. No. 47. Captain W. J. Oliver, Hoselaw, Kelso, "Lady Linton II."

CLASS 5. HEIFER, calved in 1896.—Premiums, £10, £5, £3, and £2.

1st. No. 55. George Harrison, The Hall, Gainford, Darlington, "Bessie Martin."
2nd. No. 59. Robert A. Yerburgh, M.P., Woodfold Park, Blackburn, "Ringdale Bella II."
3rd. No. 57. The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh, "Dalmeny Princess 3rd."
4th. No. 52. William Bell, Ratcheugh, Alnwick, "Lady Clara 3rd."
V.H.C. No. 54. George Harrison, The Hall, Gainford, Darlington, "Culphin 6th."
H.C. No. 50. W. & T. Bain, Legars, Kelso, "Precious Gift."
C. No. 51. W. & T. Bain, Legars, Kelso, "Precious Jewel."

CLASS 6. HEIFER, calved in 1897.—Premiums, £10, £5, £3, and £2.

1st. No. 63. George Harrison, The Hall, Gainford, Darlington, "Fairy Queen."
2nd. No. 62. George Harrison, The Hall, Gainford, Darlington, "Kathleen."
3rd. No. 60. William Bell, Ratcheugh, Alnwick, "Comely."
4th. No. 66. George Longmore, Rettie, Banff, "Castilla."
V.H.C. No. 71. C. Home Graham Stirling of Strowan, Crieff, "Strowan Marchioness 5th."
H.C. No. 68. James Milne, jun., Nether Cairnhill, Muchalls, "Kathleen 3rd."
C. No. 67. James M'William, Stoneytown, Keith, "Sunbeam 5th."

ABERDEEN-ANGUS.

PRESIDENT'S MEDAL for best Aberdeen-Angus Animal.

No. 109. The Earl of Strathmore, Glamis Castle, Glamis, "May of Glamis" (24,827).

Reserve.

No. 75. C. Bolden, Preston Bissett, Buckingham, "Proud Duke of Ballindalloch" (12,031).

Best Bull of any age in Classes 7, 8, *and* 9—Ballindalloch Challenge Cup, value £50, given by the late Mr Macpherson Grant of Drumduan. The Cup shall be held by the winner for one year, and shall become the property of the Exhibitor who shall win it five times, not necessarily in succession.

No. 75. C. Bolden, Preston Bissett, Buckingham, "Proud Duke of Ballindalloch" (12,031).

Reserve.

No. 92. William Shaw Adamson, Careston Castle, Brechin, "Diaz" (14,272).

Breeder of best Bull of any age in Classes 7, 8, *and* 9—Silver Medal.

No. 75. Sir G. Macpherson Grant, Bart., Ballindalloch Castle, Ballindalloch.

Breeder of the Winner of the Ballindalloch Challenge Cup—Silver Medal.

No. 75. Sir George Macpherson Grant, Bart., Ballindalloch.

Best Animal of the Breed—Champion Gold Medal, given by the Polled Cattle Society.

No. 109. The Earl of Strathmore, Glamis Castle, Glamis, "May of Glamis" (24,827).

Reserve.

No. 75. C. Bolden, Preston Bissett, Buckingham, "Proud Duke of Ballindalloch" (12,031).

CLASS 7. BULL, calved before 1st December 1895.—Premiums, £15, £10, £5, and £3.

1st. No. 75. C. Bolden, Preston Bissett, Buckingham, "Proud Duke of Ballindalloch" (12,031).
2nd. No. 82. The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh, "Edenhall" (12,442).
3rd. No. 74. William Shaw Adamson, Careston Castle, Brechin, "Junior Rover" (11,796).
4th. No. 79. George Smith Grant, Auchorachan, Glenlivet, Ballindalloch, "Edric" (9110).
V.H.C. No. 81. Sir Robert D. Moncreiffe of Moncreiffe, Bart., Bridge of Earn, "Clansman of Fordie" (12,363).
H.C. No. 78. Sir George Macpherson Grant, Bart., The Castle, Ballindalloch, "Prince Ito" (12,869).
C. No. 77. J. Douglas Fletcher of Rosehaugh, Avoch, N.B., "Baron Ambrose" (12,265).

CLASS 8. BULL, calved on or after 1st December 1895.—Premiums, £15, £10, £5, and £3.

1st. No. 91. Clement Stephenson, Sandyford Villa, Newcastle-upon-Tyne, "Best Man of Benton" (13,173).
2nd. No. 88. Marquis of Huntly, Aboyne Castle, Aboyne, "Jipsey Baron" (13,532).
3rd. No. 87. George Smith Grant, Auchorachan, Glenlivet, Ballindalloch, "Quintus M. 2nd" (13,888).
4th. No. 86. Sir T. D. Gibson-Carmichael of Castlecraig, Bart., M.P., Dolphinton, "Diplomat" (13,310).
V.H.C. No. 85. Patrick Chalmers, Aldbar Castle, Brechin, "Annesley" (13,128).
H.C. No. 89. The Earl of Mansfield, Ardgilzean, Perth, "Jipsey Prince" (13,533).
C. No. 90. Thomas Smith, Powrie, Dundee, "Rover 19th of Powrie" (13,928).

CLASS 9. BULL, calved on or after 1st December 1896.—Premiums, £12, £8, £4, and £2.

1st. No. 92. William Shaw Adamson, Careston Castle, Brechin, "Diaz" (14,272).
2nd. No. 95. The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh, "Plutocrat of Dalmeny" (14,800).
3rd. No. 94. The Earl of Mansfield, Ardgilzean, Perth, "Actor Grand" (14,069).
4th. No. 93. Charles Edward Hunter, Selaby Park, Darlington, "Crowbar" (14,233).
V.H.C. No. 96. Thomas Smith, Powrie, Dundee, "Wilfred 31st" (15,080).

Best Cow of any age in Class 10—Ballindalloch Challenge Cup, value £50, given by the late Mr Macpherson Grant of Drumduan. The Cup shall be held by the winner for one year, and shall become the property of the Exhibitor who shall win it five times, not necessarily in succession.

No. 105. George Willsher, Pitpointie, Dundee, "Blooming Rose" (21,278).

Breeder of the Winner of the Ballindalloch Challenge Cup—Silver Medal.

No. 105. George Willsher, Pitpointie, Dundee.

CLASS 10. COW, of any age.—Premiums, £12, £8, £4, and £2.

1st. No. 105. George Willsher, Pitpointie, Dundee, "Blooming Rose" (21,278).
2nd. No. 98. Sir George Macpherson Grant, Bart., The Castle, Ballindalloch, "Elixir" (21,809).
3rd. No. 101. The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh, "Pridella of Dalmeny 2nd" (22,222).

4th. No. 99. Sir George Macpherson Grant, Bart., The Castle, Ballindalloch, "Gardenia" (22,997).
V.H.C. No. 97. Patrick Chalmers, Aldbar Castle, Brechin, "Annuity 4th" (18,926).
H.C. No. 103. Thomas Smith, Powrie, Dundee, "Witch of Endor 25th" (32,348).
C. No. 104. Thomas Smith, Powrie, Dundee, "Witch of Endor 26th" (22,349).

CLASS 11. HEIFER, calved on or after 1st December 1895.—Premiums, £10, £5, £3, and £2.

1st. No. 109. The Earl of Strathmore, Glamis Castle, Glamis, "May of Glamis" (24,827).
2nd. No. 108. The Earl of Strathmore, Glamis Castle, Glamis, "Estille" (24,824).
3rd. No. 107. The Seaton Delaval Coal Company, Limited, Seaton Delaval, R.S.O., Northumberland, "Pride 2nd of Delaval" (24,692).
4th. No. 110. George Willsher, Pitpointie, Dundee, "Queen Mab of Pitpointie" (24,946).

CLASS 12. HEIFER, calved on or after 1st December 1896.—Premiums, £10, £5, £3, and £2.

1st. No. 127. The Earl of Strathmore, Glamis Castle, Glamis, "Victoria of Glamis" (26,198).
2nd. No. 122. The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh, "Pridella of Dalmeny 4th" (25,987).
3rd. No. 129. The Earl of Strathmore, Glamis Castle, Glamis, "Venelia" (26,197).
4th. No. 112. William Shaw Adamson, Careston Castle, Brechin, "Juliet of Careston" (25,017).
V.H.C. No. 126. The Earl of Strathmore, Glamis Castle, Glamis, "Electra of Glamis" (26,185).
H.C. No. 111. William Shaw Adamson, Careston Castle, Brechin, "Harris Tweed" (26,189).
C. No. 118. Robert Glahome, Windmill Hill, Beal, R.S.O., "Grateful of Beal" (25,463).
C. No. 119. George Smith Grant, Auchorachan, Glenlivet, Ballindalloch, "Erica Fairy 2nd" (25,504).
C. No. 123. The Seaton Delaval Coal Company, Limited, Seaton Delaval, R.S.O., Northumberland, "Pride of Coquet 3rd" (25,678).
C. No. 125. Thomas Smith, Powrie, Dundee, "Witch of Endor 35th" (26,106).

GALLOWAY.

PRESIDENT'S MEDAL for best Galloway.

No. 149. John Cunningham, Durhamhill, Dalbeattie, "Louisa 2nd of Durhamhill" (14,925).

Reserve.

No. 142. John Cunningham, Durhamhill, Dalbeattie, "Maggie Lauder of Durhamhill" (13,994).

Breeder of best Bull of any age in Classes 13, 14, *and* 15—Silver Medal.

No. 131. C. Graham, Harelawhill, Canonbie.

CLASS 13. BULL, calved before 1st January 1896.—Premiums, £15, £10, £5, and £3.

1st. No. 131. John Cunningham, Durhamhill, Dalbeattie, "Scottish Standard" (6488).
2nd. No. 132. Robert Jefferson, Rothersyke, Egremont, Cumberland, "Macpherson" (5454).

CLASS 14. BULL, calved in 1896.—Premiums, £15, £10, £5, and £3.

1st. No. 134. H. G. Murray Stewart of Cally, Gatehouse, N.B., "Lord Wedholm" (6587).
2nd. No. 133. Christopher Graham, Skipmyre, Lochmaben, N.B., "Minotaur" (6620).

CLASS 15. BULL, calved in 1897.—Premiums, £12, £8, £4, and £2.

1st. No. 136. Robert Jefferson, Rothersyke, Egremont, Cumberland, "Jubilee Gift" (6856).
2nd. No. 135. The Duke of Buccleuch and Queensberry, K.G., K.T., Drumlanrig Castle, Thornhill, "Barrose" (6809).
3rd. No. 138. H. G. Murray Stewart of Cally, Gatehouse, N.B., "Mac-Pat" (6834).

CLASS 16. COW, of any age.—Premiums, £12, £8, £4, and £2.

1st. No. 142. John Cunningham, Durhamhill, Dalbeattie, "Maggie Lauder of Durhamhill" (13,994).
2nd. No. 143. John Cunningham, Durhamhill, Dalbeattie, "Louisa of Durhamhill" (14,355).
3rd. No. 139. The Duke of Buccleuch and Queensberry, K.G., K.T., Drumlanrig Castle, Thornhill, "Lady Margaret of Drumlanrig" (15,012).
4th. No. 140. Countess of Carlisle, Naworth Castle, Brampton, Cumberland, "Vaudeville 4th of Naworth" (13,172).

CLASS 17. HEIFER, calved in 1896.—Premiums, £10, £5, £3, and £2.

1st. No. 149. John Cunningham, Durhamhill, Dalbeattie, "Louisa 2nd of Durhamhill" (14,925).
2nd. No. 147. The Duke of Buccleuch and Queensberry, K.G., K.T., Drumlanrig Castle, Thornhill, "Amelia 2nd of Drumlanrig" (14,660).
3rd. No. 150. Sir Robert Jardine of Castlemilk, Bart., Lockerbie, "Countess of Castlemilk" (14,676).
4th. No. 148. The Duke of Buccleuch and Queensberry, K.G., K.T., Drumlanrig Castle, Thornhill, "May Queen 3rd of Tarbreoch" (14,752).
V.H.C. No. 151. Sir Robert Jardine of Castlemilk, Bart., Lockerbie, "Nancy Lee 2nd of Castlemilk" (14,678).
H.C. No. 152. William Parkin-Moore, Whitehall, Mealsgate, Cumberland, "Minette 2nd of Whitehall" (14,840).

CLASS 18. HEIFER, calved in 1897.—Premiums, £10, £5, £3, and £2.

1st. No. 157. John Cunningham, Durhamhill Dalbeattie, "Maggie Lauder 2nd of Durhamhill" (15,140).
2nd. No. 159. Sir Robert Jardine of Castlemilk, Bart., Lockerbie, "Cricket of Castlemilk" (15,022).
3rd. No. 163. H. G. Murray Stewart of Cally, Gatehouse, N.B., "Annie 3rd of Cally" (15,275).
4th. No. 158. Sir Robert Jardine of Castlemilk, Bart., Lockerbie, "Minx of Castlemilk" (15,026).
V.H.C. No. 156. Countess of Carlisle, Naworth Castle, Brampton, Cumberland, "Vaudeville 7th of Naworth" (15,111).
H.C. No. 155. The Duke of Buccleuch and Queensberry, K.G., K.T., Drumlanrig Castle, Thornhill, "Pride 16th of Drumlanrig" (15,007).

HIGHLAND.

PRESIDENT'S MEDAL for best Highland Animal.

No. 170. The Duke of Atholl, K.T., Blair Castle, Blair Atholl, "Calum Riabhach II."

Breeder of best Bull of any age in Classes 19, 20, *and* 21—Silver Medal.

No. 170. The Duke of Atholl, K.T., Blair Castle, Blair Atholl.

CLASS 19. BULL, calved before 1st January 1896.—
Premiums, £15, £10, £5, and £3.

1st. No. 165. William Dalziel Mackenzie of Farr, Farr House, Daviot, Inverness, "Calum Ban of Atholl" (1203).
2nd. No. 166. Lord Malcolm of Poltalloch, C.B., Poltalloch, Lochgilphead, "Balach-a-Ghlinne-So" (1191).

3rd. No. 168. The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Duke of Leon" (1232).

4th. No. 167. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O., Argyleshire, "Valentine XIV" (1289).

V.H.C. No. 164. Alexander Macdonald Edenwood, Springfield, Fife, "Gille Molach" (1242).

H.C. No. 169. The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Drostan" (1231).

CLASS 20. BULL, calved in 1896.—Premiums, £15, £10, £5, and £3.

1st. No. 170. The Duke of Atholl, K.T., Blair Castle, Blair Atholl, "Calum Riabhach II."

2nd. No. 173. John Stewart of Ensay, Ensay, Obbe, "Rhu-na-Scarbh."

3rd. No. 172. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O., Argyleshire, "Victor XVI."

4th. No. 171. Alexander Macdonald, Edenwood, Springfield, Fife, "Morair Buidhe II." (1265).

CLASS 21. BULL, calved in 1897.—Premiums, £12, £8, £4, and £2.

1st. No. 177. William Nimmo, Castle Eden, Co. Durham, "Carrington."

2nd. No. 179. The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Darnley" (1263).

3rd. No. 174. J. S. Ainsworth of Ardanaiseig, Kilchrenan, Argyle, "Tailceanach of Ardanaiseig."

4th. No. 178. The Earl of Southesk, K.T., Kinnaird Castle, Brechin, "Clarence."

V.H.C. No. 175. J. S. Ainsworth of Ardanaiseig, Kilchrenan, Argyle, "Caiteanach of Ardanaiseig."

CLASS 22. COW, of any age.—Premiums, £12, £8, £4, and £2.

1st. No. 186. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O., Argyleshire, "Phroiseag IV. of Ardtornish" (2275).

2nd. No. 184. William Nimmo, Castle Eden, Co. Durham, "Blackie" (3358).

3rd. No. 180. John S. Blair, Melfort, Kilmelford, "Maggie of Melfort" (3493).

4th. No. 185. William Nimmo, Castle Eden, Co. Durham, "Sgiathach 11th" (3806).

V.H.C. No. 182. Lord Malcolm of Poltalloch, C.B., Poltalloch, Lochgilphead, "Proiseag Ruadh of Poltalloch" (3272).

H.C. No. 183. Lord Malcolm of Poltalloch, C.B., Poltalloch, Lochgilphead, "A'Bhanarach of Poltalloch" (3712).

CLASS 23. HEIFER, calved in 1895.—Premiums, £10, £5, £3, and £2.

1st. No. 193. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O., "Sgiathach 16th."

2nd. No. 190. George Bullough, Isle of Rum, Oban, "Rhomna."

3rd. No. 194. John Stewart of Ensay, Ensay, Obbe, "Laochag Bhuidhe 2nd."

4th. No. 192. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O., "Sgiathach XV" (3809).

V.H.C. No. 189. J. S. Ainsworth of Ardanaiseig, Kilchrenan, Argyle, "Nigheanag Buidhe of Ardanaiseig."

H.C. No. 191. J. H. Munro Mackenzie, Calgary, Tobermory, "Norah."

CLASS 24. HEIFER, calved in 1896.—Premiums, £10, £5, £3, and £2.

1st. No. 201. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O. "Sgiathach 22nd."

2nd. No. 200. Thomas Valentine Smith of Ardtornish, Morvern, R.S.O. "Sgiathach 21st."

3rd. No. 195. J. S. Ainsworth of Ardanaiseig, Kilchrenan, Argyle, "A Bheadarrach III. of Ardanaiseig."

4th. No. 196. Sir William Ogilvy Dalgleish, Bart. of Errol, Errol Park, Errol, "Manilla" (3584).

V.H.C. No. 198. J. H. Munro Mackenzie, Calgary, Tobermory, "Nightshade."

H.C. No. 197. Sir William Ogilvy Dalgleish, Bart. of Errol, Errol Park, Errol, "Prudence" (3586).

AYRSHIRE.

PRESIDENT'S MEDAL for best Ayrshire.

No. 218. R. & J. M'Alister, Mid Ascog, Rothesay, "Cherry Ripe."

Breeder of best Bull of any age in Classes 25, 26, *and* 27—Silver Medal.

No. 204. Robert Osborne, Wynholm, Lockerbie.

CLASS 25. BULL, calved before 1st January 1896.—Premiums, £12, £8, and £4.

1st. No. 202. James M'Farlane, Oxhill, Buchlyvie, "Hover's Standard" (3361).

CLASS 26. BULL, calved in 1896.—Premiums, £12, £8, and £4.

1st. No. 204. Robert Osborne, Wynholm, Lockerbie, "Gigantic Stunner" (3872).
2nd. No. 203. James Howie, Hillhouse, Kilmarnock, "Kooh-i-noor" (3678).
3rd. No. 205. Robert Wardrop, Garlaff, Cumnock, "Darnley" (3599).

CLASS 27. BULL, calved in 1897.—Premiums, £8, £5, and £3.

1st. No. 208. James Howie, Hillhouse, Kilmarnock, "Bend'Or."
2nd. No. 212. Robert Montgomerie, Lessnessock, Ochiltree, "Blucher."
3rd. No. 206. Alexander Y. Allan, Croftjane, Thornhill, "Warrington" (3866).
V.H.C. No. 215. Robert Wardrop, Garlaff, Cumnock, "Barney."
H.C. No. 213. Robert Osborne, Wynholm, Lockerbie, "Emblem of Elegance" (3873).
C. No. 207. G. J. Fergusson-Buchanan, Auchentorlie, Bowling, "Prince of Auchentorlie."
C. No. 209. Peter Macdonald, The Douglas Hotel, Brodick, "Sir John Moore."

CLASS 28. COW (in Milk), calved before 1895.—Premiums, £10, £7, and £3.

1st. No. 218. R. & J. M'Alister, Mid Ascog, Rothesay, "Cherry Ripe."
2nd. No. 219. Sir Mark J. M'Taggart Stewart, Bart., M.P., Southwick, by Dumfries, "Bess of Promise" (9362).

CLASS 29. COW (in Milk), calved in 1895.—Premiums, £10, £7, and £3.

1st. No. 221. Alexander Cross of Knockdon, Maybole, "Strawberry III." (9966).
2nd. No. 220. George Bryson, The Craigs, Bathgate, "Juniper 12th of Burnhead" (9826).

CLASS 30. COW of any age, in Calf, or HEIFER calved in 1895, in Calf and due to calve within three months of the first day of the Show.—Premiums, £10, £7, and £3.

1st. No. 222. G. J. Fergusson-Buchanan, Auchentorlie, Bowling, "Annie" (8991).
2nd. No. 224. Andrew Mitchell, Barcheskie, Kirkcudbright, "Mirley."
3rd. No. 223. R. & J. M'Alister, Mid Ascog, Rothesay, "Dandy, Y. C."

CLASS 31. HEIFER, calved in 1896.—Premiums, £10, £5, and £3.

1st. No. 225. James Howie, Hillhouse, Kilmarnock, "Dewdrop of Hillhouse."
2nd. No. 226. Andrew Mitchell, Barcheskie, Kirkcudbright, "Bright Lady."
3rd. No. 228. Sir Mark J. M'Taggart Stewart, Bart., M.P., Southwick, by Dumfries, "Betty III."
V.H.C. No. 227. Sir Mark J. M'Taggart Stewart, Bart., M.P., Southwick, by Dumfries, "Florence."
C. No. 229. Robert Wardrop, Garlaff, Cumnock, "Young Lady."

CLASS 32. HEIFER, calved in 1897.—Premiums, £8, £5, and £3.

1st. No. 233. Robert Montgomerie, Lessnessock, Ochiltree, "Pansy of Lessnessock."
2nd. No. 238. Robert Wardrop, Garlaff, Cumnock, "Lily Langtry."
3rd. No. 231. Andrew Mitchell, Barcheskie, Kirkcudbright, "Cherry 3rd."

V.H.C. No. 234. Robert Montgomerie, Lessnessock, Ochiltree, "Viola of Lessnessock."
H.C. No. 232. Andrew Mitchell, Barcheskie, Kirkcudbright, "Nell Gwynne."
C. No. 235. Robert Osborne, Wynholm, Lockerbie, "Nancy."
C. No. 237. Sir Mark J. M'Taggart Stewart, Bart., M.P., Southwick, by Dumfries, "Rosebud III."

EXTRA CATTLE.

The following were Very Highly Commended and Medium Silver Medals awarded.

No. 240. T. R. B. Elliot, Clifton Park, Kelso, Jersey Cow, "Grey Girl."
No. 243. Colonel C. Hope of Cowdenknowes, Earlston, Highland Ox.

The following were Highly Commended and Medium Silver Medals awarded.

No. 241. T. R. B. Elliot, Clifton Park, Kelso, Jersey Cow, "Golden Cloud."
No. 242. Lord Malcolm of Poltalloch, C.B., Poltalloch, Lochgilphead, Dexter Bull, "Warrior."

The following were Commended and Bronze Medals awarded.

No. 239. T. R. B. Elliot, Clifton Park, Kelso, Jersey Bull, "Grey Lad."
No. 244. Colonel C. Hope of Cowdenknowes, Earlston, Highland Ox.

HORSES

FOR AGRICULTURAL PURPOSES.

DRAUGHT STALLIONS.

PRESIDENT'S MEDAL for best Clydesdale Stallion.

No. 274. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright, "Benedict" (10,315).

Breeder of best Male Animal of any age in Classes 33 *to* 36—Silver Medal.

No. 274. William Marshall, Lochfergus, Kirkcudbright.

CLASS 33. STALLION, foaled before 1st January 1895.—Premiums, £20, £15, £10, and £4.

1st. No. 253. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright, "Montrave Sentinel" (10,094).
2nd. No. 247. William Dunlop, Dunure Mains, Ayr, "Montrave Mac" (9958).
3rd. No. 251. A. &. W. Montgomery, Netherhall and Banks, Kirkcudbright, "Prince of Quality" (10,416*).
4th. No. 255. W. S. Park, Hatton, Bishopton, "Captain Alexander" (10,175).
V.H.C. No. 245. John Crawford, jun., Manraehead, Beith, "Moncreiffe Duke" (10,092).
H.C. No. 250. Matthew Marshall, Stranraer, "Prince of Garthland" (9828).

CLASS 34. ENTIRE COLT, foaled in 1895.—Premiums, £20, £15, £10, and £4.

1st. No. 267. Herbert Webster, Morton House, Fence Houses, "Prince Thomas" (10,262).
2nd. No. 265. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright, "Masher" (10,232).
3rd. No. 262. John M'Donald, Boquhanran, Dalmuir, "Gay Prince."
4th. No. 260. Thomas Kennedy, Glenhead, Uplawmoor, "Prince of Roxburgh."
V.H.C. No. 258. John Crawford, jun., Manraehead, Beith, "Gallant Robert" (10,347).
H.C. No. 266. Lord Polwarth, Mertoun House, St Boswells, "MacRaith" (10,229).

CLASS 35. ENTIRE COLT, foaled in 1896.—Premiums, £20, £12, £8, and £4.

1st. No. 274. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright, "Benedict" (10,315).
2nd. No. 286. Herbert Webster, Morton House, Fence Houses, "Lord Fauntleroy" (10,370).
3rd. No. 284. William Taylor, Park Mains, Renfrew, "Sir Simon" (10,465).
4th. No. 281. John Pollock, Paper Mill, Langside, Glasgow, "The Charming Prince."
V.H.C. No. 280. R. & R. Percival, Burgh-by-Sands, Carlisle, "Lothian's Best" (10,374).
H C. No. 278. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright, "Ornament."
C. No. 268. James Crawford, Floshend, Gretna, "Prince of Gretna" (10,410).

CLASS 36. ENTIRE COLT, foaled in 1897.—Premiums, £15, £10, £6, and £4.

1st. No. 300. W. S. Park, Hatton, Bishopton.
2nd. No. 287. Wm. Clark, Netherlea, Cathcart, "Baron Bombie."
3rd. No. 293. James Kilpatrick, Craigie Mains, Kilmarnock.
4th. No. 298. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright.
V.H.C. No. 297. A. & W. Montgomery, Netherhall and Banks, Kirkcudbright.

DRAUGHT GELDINGS.

PRESIDENT'S MEDAL for best Draught Gelding.

No. 309. James Young & Sons, railway contractors, Edinburgh, "Masterpiece."

CLASS 37. DRAUGHT GELDING, foaled before 1st January 1895.—Premiums, £10, £5, and £3.

1st. No. 309 James Young & Sons, railway contractors, Edinburgh, "Masterpiece."
2nd No. 308. James Young & Sons, railway contractors, Edinburgh, "Sir Andrew."
3rd. No. 307. Alexander Guild, Greenhead, Pencaitland, "Mac."
V.H.C. No. 305. T. Cabry, Shidlaw, Coldstream, "Prince."

CLASS 38. DRAUGHT GELDING, foaled in 1895.—Premiums, £6, £4, and £3.

1st. No. 314. Alexander Woodburn, Goatfoot, Galston, "Snappietousler."
2nd. No. 316. James Young & Sons, railway contractors, Edinburgh, "Cathcart."
3rd. No. 312. David Hastie, Stonefield Farm, Blantyre, "Davie."
V.H.C. No. 315. James Young & Sons, railway contractors, Edinburgh, "Quality."
H.C. No. 311. Alexander Guild, Greenhead, Pencaitland.

CLASS 39. DRAUGHT GELDING, foaled in 1896.—Premiums, £6, £4, and £3.

1st. No. 317. William Clark, Netherlea, Cathcart, "Sandy."
2nd. No 325. D. Riddell, Blackhall, Paisley.
3rd. No. 322. David Hastie, Stonefield Farm, Blantyre, "Stonefield."
V.H.C. No 318. William Clark, Netherlea, Cathcart.
H.C. No. 321. A. B. Matthews, British Linen Bank, Newton Stewart, "Gladiator."

DRAUGHT MARES AND FILLIES.

PRESIDENT'S MEDAL for best Clydesdale Mare or Filly.

No. 346. Sir John Gilmour of Montrave, Bart., Leven, "Montrave Maud" (11,786).

Best Mare or Filly registered in the Clydesdale Stud-Book—Cawdor Challenge Cup, value 50 guineas, given by the Clydesdale Horse Society. The Cup must be won three times by an Exhibitor (but not necessarily in consecutive years or with the same animal) before it becomes his absolute property.

No. 346. Sir John Gilmour of Montrave, Bart., Leven, "Montrave Maud" (11,786).

Reserve.

No. 326. William Dunlop, Dunure Mains, Ayr, "Mary Kerr."

Class 40. MARE, of any age, with Foal at foot.— Premiums, £20, £12, £7, and £4.

1st. No. 326. William Dunlop, Dunure Mains, Ayr, "Mary Kerr."
2nd. No. 332. W. H. Lumsden of Balmedie, Aberdeenshire, "Balmedie Queen Mab."
3rd. No. 335. D. Riddell, Blackhall, Paisley, "Lightsome Lass."
4th. No. 334. D. Mitchell, Millfield, Polmont, "Lily Langtry."
V.H.C. No. 336. D. Riddell, Blackhall, Paisley, "Lady Vere."
H.C. No. 328. David Dunn, Roxburgh Mains, Roxburgh, "Roxburgh Mid."

Class 41. YELD MARE, foaled before 1st January 1895.— Premiums, £12, £9, £6, and £4.

1st. No. 344. Herbert Webster, Morton House, Fence Houses, "Lady Lothian" (13,319).
2nd. No. 342. D. Riddell, Blackhall, Paisley, "Camilla."
3rd. No. 345. William Young, Drum, Campbeltown, "Drum Fancy."
4th. No. 340. The Marquis of Londonderry, K.G., Seaham Hall, Seaham Harbour, "High Tide" (12,821).
V.H.C. No. 337. W. J. P. Beattie, Hope Lodge, Moffat, "Bonnie Doon" (12,072).
H.C. No. 339. R. & J. Findlay, Springhill, Baillieston, "Baroness."

EXTRA STOCK.

V.H.C. No. 346. Sir John Gilmour of Montrave, Bart., Leven, "Montrave Maud" (11,786)—Medium Silver Medal.

Class 42. FILLY, foaled in 1895.—Premiums, £12, £9, £6, and £4.

1st. No. 347. G. & J. Cocker, Hill of Petty, Fyvie, "Golden Belle."
2nd. No. 354. The Marquis of Londonderry, K.G., Seaham Hall, Seaham Harbour, "Essence."
3rd. No. 356. William M'Keich, Woodend, Bucklyvie, by Stirling, "Lady Ratian."
4th. No. 349. Leslie Durno, Mains of Glack, Old Meldrum, "Royal Princess."
V.H.C. No. 358. Lord Polwarth, Mertoun House, St Boswells, "Border Meg."
H.C. No. 360. Colonel Patrick Stirling of Kippendavie, Dunblane, "Doreen."
C. No. 357. James F. Murdoch, East Hallside, Newton, "Lady M'Lelland."

Class 43. FILLY, foaled in 1896.—Premiums, £12, £9, £6, and £4.

1st. No. 371. A. B. Matthews, British Linen Bank, Newton Stewart, "The Diamond Queen."
2nd. No. 369. The Marquis of Londonderry, K.G., Seaham Hall, Seaham Harbour.
3rd. No. 379. Herbert Webster, Morton House, Fence Houses, "Lady Victoria."
4th. No. 366. Alexander Guild, Greenhead, Pencaitland, "Lady Gartly."
V.H.C. No. 375. John Pollock, Paper Mill, Langside, Glasgow, "Lady Anderson."
H.C. No. 377. Colonel Patrick Stirling of Kippendavie, Dunblane, "Selma."
C. No. 367. William L. Johnston, Oxnam Neuk, Jedburgh, "Sally Macgregor."

Class 44. FILLY, foaled in 1897.—Premiums, £12, £9, £6, and £4.

1st. No. 384. Alexander Guild, Greenhead, Pencaitland, "Maid of Athens."
2nd. No. 383. Sir John Gilmour of Montrave, Bart., Leven, "Montrave Geisha."
3rd. No. 382. Sir John Gilmour of Montrave, Bart., Leven, "Montrave Ladybird."
4th. No. 388. R. C. Macfarlane, Greenburn, Doune, "Nancy Gartly."
V.H.C. No. 387. Robert Macfarlane, Tomich, Invergordon.
C. No. 390. Lord Polwarth, Mertoun House, St Boswells, "Border Juliet."

HUNTERS.

PRESIDENT'S MEDAL for best Hunter.

No. 400. David Mitchell, Millfield, Polmont, Colt, "Julius."

Class 45. COLT, GELDING or FILLY, foaled in 1897, the produce of Thoroughbred Stallions, out of Mares of any breed.—Five Prizes—£10, £7, £5, £2, and £1, given by Sir John Gilmour of Montrave, Bart.

1st. No. 400. David Mitchell, Millfield, Polmont, Colt, "Julius."
2nd. No. 399. Robert Henderson, East Gordon, Gordon, Filly, "Nan."
3rd. No. 396. George Dove, St Boswells Bank, St Boswells, Filly, "Clutha."
4th. No. 395. David Deuchar, Low Buston, Warkworth, Filly, "Laughing Girl."
5th. No. 403. Lord Polwarth, Mertoun House, St Boswells, Colt.

Best Hunter Filly in Classes 46 *and* 47—Gold Medal, value £10, 10s.
Given by Hunters' Improvement Society.

No. 408. Mrs Johnstone (of Halleaths), Broadholm, Lockerbie, Mare, "Liberty Belle."

Class 46. MARE or GELDING, for field, foaled in 1896, *in hand.*—Premiums, £8, £5, and £3.

1st. No. 405. William Aitchison, Kames West Mains, Greenlaw, Gelding, "Kames."
2nd. No. 406. St Clair Cunningham, Hedderwick Hill, Dunbar, Gelding.
3rd. No. 408. Mrs Johnstone (of Halleaths), Broadholm, Lockerbie, Mare, "Liberty Belle."
V.H.C. No. 412. John C. Toppin, Musgrave Hall, Penrith, Gelding, "The Pilot."
H.C. No. 410. Robert Oliver, Lochside, Kelso, Gelding, "Up-to-Date."
C. No. 411. C. H. Scott Plummer of Sunderland Hall, Selkirk, Gelding.

Class 47. MARE or GELDING, for field, foaled in 1895, *in hand.*—Premiums, £8, £5, and £3.

1st. No. 417. Andrew R. Oliver, Thornwood, Hawick, Mare.
2nd. No. 419. Robert C. Scott, Graden, Kelso, N.B., Mare, "Lady Oliver."

Class 48. HUNTER, Mare or Gelding, foaled in 1894, able to carry over 14 stone, *in saddle.*—Premiums, £20, £10, and £5.

1st. No. 421. John C. Toppin, Musgrave Hall, Penrith, Gelding, "Gamester."
2nd. No. 420. C. H. Scott Plummer of Sunderland Hall, Selkirk, Mare.

Class 49. HUNTER, Mare or Gelding, foaled in 1894, able to carry from 12 to 14 stone, *in saddle.*—Premiums, £15, £8, and £4.

1st. No. 429. J. Wilson, Helsington Laithes, Kendal, Gelding, "Staindrop."
2nd. No. 427. Robert C. Scott, Graden, Kelso, N.B., Mare, "Lady Lempitlaw."

Class 50. HUNTER, Mare or Gelding, foaled before 1st January 1894, able to carry over 14 stone, *in saddle.*—Premiums, £20, £10, and £5.

1st. No. 431. C. J. Cunningham, Wooden, Kelso, Gelding, "Freebooter."
2nd. No. 434. Fred. Usher, Norton Mains, Ratho Station, Gelding, "Moonlight."
3rd. No. 433. W. H. Thomson, Over Roxburgh, Roxburgh, Gelding, "Benbow."
V.H.C. No. 430. John Angus, Whitefield, Morpeth, Northumberland, Gelding, "Bothal."

Class 51. HUNTER, Mare or Gelding, foaled before 1st January 1894, able to carry from 12 to 14 stone, *in saddle.*—Premiums, £15, £8, and £4.

1st. No. 436. Fred. Usher, Norton Mains, Ratho Station, Mare, "Ingliston."
2nd. No. 435. Athole S. Hay, Marlefield, Roxburgh, Gelding, "Harvester."
3rd. No. 437. John Wallace, Croy, Shandon, Gelding, "Fusee III."

Class 52. HUNTER Brood Mare, with Foal at foot.—Premiums, £15, £8, and £4.

1st. No. 441. Andrew R. Oliver, Thornwood, Hawick, "Mary."
2nd. No. 440. John M'Kie, Ernespie, Castle-Douglas, "Maid of the Meynell."
3rd. No. 442. John Robson, Newton, Bellingham, "Fairy Queen."
V.H.C. No. 438. Robert Henderson, East Gordon, Gordon, "Susan."

HACKNEYS.

(ALL TO BE SHOWN IN HAND.)

PRESIDENT'S MEDAL for best Hackney.

No. 464. Marmaduke Wray, Register Square, Beverley, Yorkshire, "Windsor" (5864).

Reserve.

No. 448. Charles E. Galbraith, Terregles, Dumfries, "Trilby" (10,568).

Best Mare or Filly in Hackney or Pony Classes—Gold Medal, value £10, given by the Hackney Horse Society. A Mare 6 years old or more must have had a living foal. Winners of the Hackney Society's Medals in 1898, except at the London and Royal English Shows, excluded. The winner must be entered or accepted for entry in Hackney Stud-Book, and certified free from hereditary disease. The Gold Medal being of the intrinsic value of £10, that amount will be paid by the Hackney Horse Society at any time if the Medal be returned in good condition.

No. 486. W. & J. Thomson, Richmond House, Dullatur, Mare, "Inholmes Princess" (8997).

Reserve.

No. 449. Charles E. Galbraith, Terregles, Dumfries, "Vivandiere" (10,589).

CLASS 53. BROOD MARE, 15 hands and upwards, with Foal at foot, or to foal this season to a registered sire. Registered in the Hackney Stud-Book.—Premiums, £10, £6, and £4.

1st. No. 443. David Mitchell, Millfield, Polmont, "Filbert" (2060).

CLASS 54. BROOD MARE, under 15 hands, with Foal at foot, or to foal this season to a registered sire. Registered in the Hackney Stud-Book.—Premiums, £10, £6, and £4.

1st. No. 447. David Mitchell, Millfield, Polmont, "Snowstorm" (9527).

CLASS 55. FILLY, foaled in 1895, got by registered hackney sire.—Premiums, £8, £5, and £3.

1st. No. 448. Charles E. Galbraith, Terregles, Dumfries, "Trilby" (10,568).
2nd. No. 449. Charles E. Galbraith, Terregles, Dumfries, "Vivandiere" (10,589).
3rd. No. 450. Alexander Gemmell, Chelston, Ayr, "Diorama" (9884).

CLASS 56. FILLY, foaled in 1896, got by registered hackney sire.—Premiums, £8, £5, and £3.

1st. No. 455. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., "Dancing Girl."
2nd. No. 454. Charles E. Galbraith, Terregles, Dumfries, "Lorna."
3rd. No. 456. David Mitchell, Millfield, Polmont, "Empress."

CLASS 57. FILLY, foaled in 1897, got by registered hackney sire.—Premiums, £8, £5, and £3.

1st. No. 458. Charles E. Galbraith, Terregles, Dumfries, "Atalanta."
2nd. No. 461. Edward Ostlere, Kirkcaldy, "Limefield Rose."
3rd. No. 459. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., "Countess Marsh."

CLASS 58. STALLION, foaled in or before 1895, over 15 hands. Registered in the Hackney Stud-Book.—Premiums, £10, £6, and £4.

1st. No. 462. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., "Nectar 2nd" (6143).

CLASS 59. STALLION, foaled in or before 1895, over 14 and not over 15 hands. Registered in the Hackney Stud-Book.—Premiums, £10, £6, and £4.

1st. No. 464. Marmaduke Wray, Register Square, Beverley, Yorkshire, "Windsor" (5864).
2nd. No. 463. George R. Watson, Parkhead Cross, Glasgow, "Hedon Sensation" (6042).

CLASS 60. ENTIRE COLT, foaled in 1896. Registered in Hackney Stud-Book. —Premiums, £8, £5, and £3.

1st. No. 465. Mrs Fletcher, The Grange, Angram, York, Yorkshire, "Lord Ganymede" (6453).

CLASS 61. ENTIRE COLT, foaled in 1897, eligible for entry in Hackney Stud-Book.—Premiums, £8, £5, and £3.

1st. No. 468. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., "Laertes."
2nd. No. 470. David Mitchell, Millfield, Polmont, "Gentleman Joe."
3rd. No. 471. G. Russell Tress, Whitelee, St Boswells, "Danish Prince."

ROADSTERS.

PRESIDENT'S MEDAL for best Roadster.

No. 473. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., Mare, "Gold Lace" (8945).

CLASS 62. ROADSTER, Mare or Gelding, foaled before 1st January 1895, 15 hands and upwards, *in saddle*.—Premiums, £10, £5, and £3.

1st. No. 473. Henry Liddell-Grainger, Ayton Castle, Ayton, N.B., Mare, "Gold Lace" (8945).
2nd. No. 472. Charles E. Galbraith, Terregles, Dumfries, Mare "Queen of the West" (11,422).
3rd. No. 474. Edward Ostlere, Kirkcaldy, Mare, "Angelica" (9693).

CLASS 63. ROADSTER, Mare or Gelding, foaled before 1st January 1895, 14.2 and under 15 hands, *in saddle*.—Premiums, £10, £5, and £3.

1st. No. 481. G. Russell Tress, Whitelee, St Boswells, Mare, "Belle of the Wolds."
2nd. No. 479. Charles E. Galbraith, Terregles, Dumfries, Gelding, "Sussex" (5028).
3rd. No. 478. T. Cabry, Shidlaw, Coldstream, Gelding, "Viscount."

PONIES.

PRESIDENT'S MEDAL for best Pony.

No. 486. W. & J. Thomson, Richmond House, Dullatur, Mare, "Inholmes Princess" (8997).

CLASS 64. STALLION, 3 years old and upwards, over 12, not exceeding 14 hands, *in hand*.—Premiums, £5, £3, and £2.

One Entry—Disqualified, over height.

CLASS 65. MARE or GELDING, 3 years old and upwards, over 13, and not over 14½ hands, *in saddle*.—Premiums, £5, £3, and £2.

1st. No. 486. W. & J. Thomson, Richmond House, Dullatur, Mare, "Inholmes Princess" (8997).
2nd. No. 485. Edward Ostlere, Kirkcaldy, Mare, "Brenda" (9767).
3rd. No. 484. James Hamilton, Aldersyde, Uddingston, N.B., Mare, "Monaco."

CLASS 66. MARE or GELDING, 3 years old and upwards, over 12, and not over 13 hands, *in saddle*.—Premiums, £5, £3, and £2.

1st. No. 489. James Hamilton, Aldersyde, Uddingston, N.B., Mare, "Eva."
2nd. No. 490. James Moffat, Whitehaugh, Hawick, Mare.
3rd. No. 488. T. Cabry, Shidlaw, Coldstream, Mare, "Sunshine"

Class 67. STALLION, 3 years old and upwards, 12 hands and under, *in hand.*—Premiums, £5, £3, and £2.—*No Entry.*

Class 68. MARE or GELDING, 3 years old and upwards, 12 hands and under *in saddle.*—Premiums, £5, £3, and £2.

1st. No. 493. Athole S. Hay, Marlefield, Roxburgh, Mare, "Duckling."

SHETLAND PONIES.

(ALL TO BE SHOWN IN HAND.)

PRESIDENT'S MEDAL for best Shetland Pony.

No. 511. The Marquis of Londonderry, K.G., Maryfield Farm, Bressay, Shetland, Mare, "Bretta" (811).

Reserve.

No. 495. Countess of Hopetoun, Hopetoun House, South Queensferry, "Magician" (154).

Class 69. STALLION, not exceeding 10½ hands, foaled before 1st January 1895.—Premiums, £5, £3, and £2.

1st. No. 495. Countess of Hopetoun, Hopetoun House, South Queensferry, "Magician" (154).
2nd. No. 496. The Marquis of Londonderry, K.G., Maryfield Farm, Bressay, Shetland, "Vespa" (166).
3rd. No. 497. R. W. R. Mackenzie, Earlshall, Leuchars, "Bonaparte."

Class 70. MARE, not exceeding 10½ hands, with Foal at foot.—Premiums, £5, £3, and £2.

1st. No. 501. Mrs Wentworth Hope Johnstone, Can Hatch, Banstead, Surrey, "Sapphire."
2nd. No. 502. The Marquis of Londonderry, K.G., Maryfield Farm, Bressay, Shetland, "Thistle" (1115).
3rd. No. 500. Mrs Wentworth Hope Johnstone, Can Hatch, Banstead, Surrey, "Emerald."
V.H.C. No. 503. R. W. R. Mackenzie, Earlshall, Leuchars, "Flip" (948).
C. No. 504. Wm. Parkin-Moore, Whitehall, Mealsgate, Cumberland, "Faith" (1131).

Class 71. MARE or GELDING, not exceeding 10½ hands, foaled before 1st January 1896.—Premiums, £5, £3, and £2.

1st. No. 511. The Marquis of Londonderry, K.G., Maryfield Farm, Bressay, Shetland, Mare, "Bretta" (811).
2nd. No. 507. The Ladies Hope, Big Hollanden, Underriver, Sevenoaks, Mare, "Vementry II." (1104).
3rd. No. 509. Mrs Wentworth Hope Johnstone, Can Hatch, Banstead, Surrey, Mare, "Skylark."
V.H.C. No. 506. The Ladies Hope, Big Hollanden, Underriver, Sevenoaks, Mare, "Scada" (674).
H.C. No. 512. R. W. R. Mackenzie, Earlshall, Leuchars, Mare, "Nameless" (1119).
C. No. 510. Mrs Wentworth Hope Johnstone, Can Hatch, Banstead, Surrey, Mare, "Virtuous."
C. No. 513. Wm. Parkin-Moore, Whitehall, Mealsgate, Cumberland, Mare, "Queen of the Isles" (1133).

DRIVING COMPETITIONS.

CLASS 72. Best HORSE in HARNESS, 15 hands and upwards, to be driven in the ring.—Premiums, £10, £5, and £3.

1st. No. 475. Edward Ostlere, Kirkcaldy, Gelding, "Starlight."
2nd. No. 474. Edward Ostlere, Kirkcaldy, Mare, "Angelica" (9693).
3rd. No. 514. A. Liddle & Son, 14 Roxburgh Street, Kelso, Gelding, "Tom."

CLASS 73. Best HORSE in HARNESS, under 15 hands, to be driven in the ring.—Premiums, £10, £5, and £3.

1st. No. 484. James Hamilton, Aldersyde, Uddingston, N.B., Mare, "Monaco."
2nd. No. 485. Edward Ostlere, Kirkcaldy, Mare, "Brenda" (9767).
3rd. No. 486. W. & J. Thomson, Richmond House, Dullatur, Mare, "Inholmes Princess" (8997).
H.C. No. 481. G. Russell Tress, Whitelee, St Boswells, Mare, "Belle of the Wolds."

CLASS 74. Best TANDEM TURN-OUT, to be driven in the ring.—First Prize, Gold Medal; Second Prize, Silver Medal.

1st. { No. 474. Edward Ostlere, Kirkcaldy, Mare, "Angelica" (9693).
No. 475. Edward Ostlere, Kirkcaldy, Gelding, "Starlight."
2nd. { No. 480. James Hamilton, Aldersyde, Uddingston, N.B., Mare, "Meg Merrilees."
No. 484. James Hamilton, Aldersyde, Uddingston, N.B., Mare, "Monaco."

JUMPING COMPETITIONS.

Wednesday, 6th July.

CLASS 1. HORSES, Open.—Premiums, £20, £10, and £5.

1. T. & H. Ward, Pinchinthorpe, Great Ayton, R.S.O., Yorks, Mare, "Lady Chester."
2 (tie). { Marius Bell, Broats, Annan, Mare, "Border Witch."
F. B. Marjoribanks of Rochester, Greenlaw, Gelding, "The Don."

CLASS 2. PONIES, 14.3 hands and under.—Premiums, £8, £4, and £2.

1. James Dodds, National Hotel, Kirkcaldy, Mare.
2. David Courage, Marischal Street, Aberdeen, Mare, "Silver Queen."
3. J. & R. Mitchell, Philiphaugh Saw-Mill, Selkirk, Gelding, "Donald."

Thursday, 7th July.

CLASS 3. HORSES, Open Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize, in Class 1.—Premiums, £10, £6, and £3.

1 (tie). { John Cooper, 12 Duke Street, Hamilton, Gelding, "Bob."
Marius Bell, Broats, Annan, Mare, "Border Witch."
3. F. B. Marjoribanks of Rochester, Greenlaw, Gelding, "The Don."

CLASS 4. PONIES, 14.3 hands or under, Handicap, hurdles and gate being raised 4 inches for first-prize winner in Class 2.—Premiums, £5, £3, and £1.

1. David Courage, Marischal Street, Aberdeen, Mare, "Silver Queen."
2 (tie). { Frank Elliot, Middlestots, Duns, Gelding.
James Dodds, National Hotel, Kirkcaldy, Mare.

Friday, 8th July.

CLASS 5. HORSES, Open Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize, in either of Classes 1 or 3—4 inches extra for the winner of the two first prizes in Classes 1 and 3.—Premiums, £10, £6, and £3.

1. F. B. Marjoribanks of Rochester, Greenlaw, Gelding, "The Don."
2. J. Roberton, Ladyrig, Kelso, Gelding, "The Major."
3. John Trenholm, East Close, Sedgefield, Ferryhill, Gelding, "Rocket."

CLASS 6. PONIES, 14.3 hands or under, Handicap, hurdles and gate being raised 4 inches for the winner of the first prize in Class 2 or in Class 4, and 8 inches for winner of the first prize in both these Classes.—Premiums, £3, £2, and £1.

1. John Wilson, Crownstone, Dalston, Carlisle, Mare, "Countess."
2. James Dodds, National Hotel, Kirkcaldy, Mare.
3. Frank Elliot, Middlestots, Duns, Gelding.

Champion Prize of £10 *for most points in Prizes with one or more Horses in above Classes*—First Prize to count three points; Second Prize, two points; and Third Prize, one point. The money to be evenly divided in the event of a tie.

James Dodds, National Hotel, Kirkcaldy.

SHEEP

BLACKFACED.

PRESIDENT'S MEDAL for best Pen of Blackfaced Sheep.

No. 515. J. Archibald, Overshiels, Stow.

Best Group of Five Blackfaced Tups, any age, bred by Exhibitor, in Classes 75 *and* 76—The Muirkirk Farmers' Club Cup, value £10, given by Muirkirk Farmers' Club.

Charles Howatson of Glenbuck.

Best Blackfaced Tup above two shear in Class 75—Prize of £5, given by Muirkirk Farmers' Club.

No. 523. Charles Howatson of Glenbuck, N.B., "Pickpocket."

To Shepherds in charge of Prize-Winners in Blackfaced Sheep—£10. Given by Mr Howatson of Glenbuck.

Class 75—20s., 10s., and 5s.

1st. Robert Johnston, Shepherd to James Archibald, Overshiels.
2nd. John Clark, Shepherd to Charles Howatson of Glenbuck.
3rd. Robert Johnston, Shepherd to James Archibald, Overshiels.

Class 76—25s., 15s., and 5s.

1st. John Clark, Shepherd to Charles Howatson of Glenbuck.
2nd. Thomas Brown, Shepherd to R. & J. Cadzow, Borland.
3rd. James Hope, Shepherd to Charles Howatson of Glenbuck.

Class 77—20s., 10s., and 5s.

1st. John Clark, Shepherd to Charles Howatson of Glenbuck.
2nd. James Macfarlane, jun., Shepherd to James Macfarlane, Ashiestiel.
3rd. David Brown, Shepherd to D. T. Martin of Girgenti.

Class 78—20s., 10s., and 5s.

1st. James Hope, Shepherd to Charles Howatson of Glenbuck.
2nd. Joseph Noble, Shepherd to Tom Irving, Crew, Bewcastle.
3rd. James Macfarlane, jun., Shepherd to James Macfarlane, Ashiestiel.

Class 99—25s., 15s., and 10s.

1st. James Johnman, Shepherd to Sir John Gilmour of Montrave, Bart.
2nd. Alexander Clark, jun., Shepherd to John M'Dougal, Lylestone, Lauder.
3rd. Charles Buist, Shepherd to F. W. Christie, Dairsie Mains, Cupar, Fife.

For Blackfaced Sheep in Classes 75, 76, 77, *and* 78, *carrying the fleece best adapted for protecting the animal in a high exposed and stormy district*- Prizes, £3, £2, and £1, given by Mr Howatson of Glenbuck.

1st. No. 520. J. Archibald, Overshiels, Stow.
2nd. No. 542. Charles Howatson of Glenbuck, N.B., "Woolstapler."

3rd. No. 528. William Mitchell, Hazelside, Douglas, "Prince Alfred."
V.H.C. No. 519. J. Archibald, Overshiels, Stow.
H.C. No. 550. Messrs Macmillan, Glencrosh, Moniaive.
C. No. 537. Charles Howatson of Glenbuck, N.B., "Lochiel the Second."

For Blackfaced Sheep in Classes 75, 76, 77, *and* 78, *carrying the fleece best adapted for manufacturing purposes*—Prizes, £3, £2, and £1, given by Mr Howatson of Glenbuck.

1st. No. 564. Charles Howatson of Glenbuck, N.B.
2nd. No. 549. Messrs Macmillan, Glencrosh, Moniaive.
3rd. No. 551. Wm. Mitchell, Hazelside, Douglas.
V.H.C. No. 515. J. Archibald, Overshiels, Stow.
H.C. No. 565. Tom Irving, Crew, Bewcastle. Brampton, Cumberland.
C. No. 527. James Macfarlane, Ashiestiel. Galashiels.

CLASS 75. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

1st. No. 515. J. Archibald, Overshiels, Stow.
2nd. No. 523. Charles Howatson of Glenbuck, N.B., "Pickpocket."
3rd. No. 519. J. Archibald, Overshiels, Stow.
4th No. 520. J. Archibald, Overshiels, Stow.
V.H.C. No. 527. James Macfarlane, Ashiestiel, Galashiels.
H.C. No. 518. J. Archibald, Overshiels, Stow.
C. No. 516. J. Archibald, Overshiels, Stow.

CLASS 76. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st. No. 537. Charles Howatson of Glenbuck, N.B., "Lochiel the Second."
2nd. No 531. R. & J. Cadzow, Borland, Biggar.
3rd. No. 539. Charles Howatson of Glenbuck, N.B., "Ayrshire."
4th. No. 544. Charles Howatson of Glenbuck, N.B.
V.H.C. No. 530. R. & J. Cadzow, Borland, Biggar.
H.C. No. 532. R. & J. Cadzow, Borland, Biggar.
C. No. 542. Charles Howatson of Glenbuck, N.B., "Woolstapler."

CLASS 77. EWE, above one Shear, with her Lamb at foot.—Premiums, £10, £5, and £2.

1st. No. 553. Charles Howatson, of Glenbuck, N.B.
2nd. No. 555. James Macfarlane, Ashiestiel, Galashiels.
3rd. No. 558. Donald T. Martin, Girgenti, Irvine, Ayrshire.
V.H.C. No. 556. James Macfarlane, Ashiestiel, Galashiels, "Rachel."
H.C. No. 554. Charles Howatson of Glenbuck, N.B.
C. No. 560. Lady John Scott, Spottiswood, Lauder.

CLASS 78. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

1st. No. 563. Charles Howatson of Glenbuck, N.B.
2nd. No. 565. Tom Irving, Crew, Bewcastle, Brampton, Cumberland.
3rd. No. 567. James Macfarlane, Ashiestiel, Galashiels.
V.H.C. No. 568. Donald T. Martin, Girgenti, Irvine, Ayrshire.
H.C. No. 570. Donald T. Martin, Girgenti, Irvine, Ayrshire.
C. No. 564. Charles Howatson of Glenbuck, N.B.

CHEVIOT.

PRESIDENT'S MEDAL for best Pen of Cheviot Sheep.

No. 595. John Elliot, Hindhope, Jedburgh.

Best pen of Cheviot Sheep in Classes 79, 80, 81, *and* 82, *confined to Tups entered or eligible for entry in the Cheviot Flock Book, and Ewes or Gimmers from a pedigreed flock*—Prize of £10, given by Cheviot Sheep Society.

No. 595. John Elliot, Hindhope, Jedburgh.

CLASS 79. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

1st. No. 576. John Elliot, Hindhope, Jedburgh.
2nd. No. 579. John A. Johnstone, Archbank, Moffat.
3rd. No. 577. John Elliot, Hindhope, Jedburgh.
4th. No. 580. John A. Johnstone, Archbank, Moffat.
V.H.C. No. 581. John A. Johnstone, Archbank, Moffat.
H.C. No. 588. John Robson, Newton, Bellingham, "Cock o' the North."
C. No. 574. George Douglas, Hindhope, Jedburgh.

CLASS 80. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st. No. 595. John Elliot, Hindhope, Jedburgh.
2nd. No. 598. John Elliot, Hindhope, Jedburgh.
3rd. No. 597. John Elliot, Hindhope, Jedburgh.
4th. No. 615. John Robson, Newton, Bellingham.
V.H.C. No. 603. John A. Johnstone, Archbank, Moffat.
H.C. No. 614. John Robson, Newton, Bellingham, "Duke of Northumberland."
C. No. 604. John A. Johnstone, Archbank, Moffat.

CLASS 81. EWE, above one Shear, with her Lamb at foot.—Premiums, £10, £5, and £2.

1st. No. 620. John Elliot, Hindhope, Jedburgh.
2nd. No. 621. John Elliot, Hindhope, Jedburgh.
3rd. No. 619. John Elliot, Hindhope, Jedburgh.
V.H.C. No. 624. Jacob Robson, Byrness, Otterburn, Northumberland.
H.C. No. 625. Jacob Robson, Byrness, Otterburn, Northumberland.

CLASS 82. SHEARLING EWE or GIMMER.—Premiums, £10, £5. and £2.

1st. No. 639. John Robson, Newton, Bellingham.
2nd. No. 632. James Moffat, Whitehaugh, Hawick.
3rd. No. 638. John Robson, Newton, Bellingham.
V.H.C. No. 628. John Elliot. Hindhope, Jedburgh.
H.C. No. 629. John Elliot, Hindhope, Jedburgh.
C. No. 630. John Elliot, Hindhope, Jedburgh.

BORDER LEICESTER.

PRESIDENT'S MEDAL for best Pen of Border Leicesters.

No. 653. Matthew Templeton, Drumore, Kirkcudbright.

Tweeddale Gold Medal, value £20, for best Border Leicester Tup.

No. 653. Matthew Templeton, Drumore, Kirkcudbright.

CLASS 83. TUP, above one Shear.—Premiums, £12, £8, £4, and £2

1st. No. 653. Matthew Templeton, Drumore, Kirkcudbright.
2nd. No. 652. Robert Taylor, Pitlivie, Carnoustie.
3rd. No. 651. George Simson, Courthill, Kelso.
4th. No. 647. Christopher Graham, Skipmyre, Lochmaben.
V.H.C. No. 644. Archibald Fairbairn, Butchercote, St Boswells.
H.C. No. 642. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.
C. No. 643. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.

CLASS 84. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st. No. 667. J. Douglas Fletcher of Rosehaugh, Avoch, N.B.
2nd. No. 661. Thomas Clark, Oldhamstocks Mains, Cockburnspath.
3rd. No. 689. Matthew Templeton, Drumore, Kirkcudbright.
4th. No. 697. Robert Wallace, Auchenbrain, Mauchline.
V.H.C. No. 659. The Duke of Buccleuch and Queensberry, K.T., Dalkeith Park Dalkeith.
H.C. No. 698. Robert Wallace, Auchenbrain, Mauchline.
C. No. 663. Thomas Clark, Oldhamstocks Mains, Cockburnspath.

CLASS 85. EWE, above one Shear.—Premiums, £10, £5, and £2.

1st. No. 703. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.
2nd. No. 706. James Nisbet, Lambden, Greenlaw.
3rd. No. 709. Thomas Winter, Springfield House, Sherburn, York.
V.H.C. No. 708. Alexander White, Nottylees, Kelso.
H.C. No. 707. Charles Scott, East Lilburn, West Lilburn, R.S.O.
C. No. 704. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.

CLASS 86. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

1st. No. 717. Alexander Cross of Knockdon, Maybole.
2nd. No. 723. William Ford, Fentonbarns, Drem.
3rd. No. 714. Thomas Clark, Oldhamstocks Mains, Cockburnspath.
V.H.C. No. 719. Alexander Cross of Knockdon, Maybole.
H.C. No. 712. The Duke of Buccleuch and Queensberry, K.T., Dalkeith Park, Dalkeith.
C. No. 716. Thomas Clark, Oldhamstocks Mains, Cockburnspath.

EXTRA STOCK.

The following was Very Highly Commended and a medium Silver Medal awarded:—

No. 880. Lord Polwarth, Mertoun House, St Boswells.—Family Group of Border Leicester Sheep. (*A*) Border Leicester Ram—"Border Chief." (*B*) Border Leicester Ewe. (*C*) Border Leicester Pen of three Rams (triplets).

HALF-BRED.

PRESIDENT'S MEDAL for best pen of Half-Breds.

No. 786. Robert Dickinson, Longcroft, Lauder.

Best Half-Bred Tup in Classes 87 *and* 88 -£10, given by Breeders of Half-Bred Sheep, per Mr John Bertram.

No. 751. Andrew T. Elliot, Newhall, Galashiels.

CLASS 87. TUP, above one Shear.—Premiums, £12, £8, £4, and £2.

1st. No. 738. William Elliot, Raecleugh Head, Duns.
2nd. No. 740. James A. W. Mein, Hunthill, Jedburgh.
3rd. No. 735. Alex. Crosbie, Blegbie, Upper Keith.
4th. No. 737. William Davidson, Colmslie, Galashiels.
V.H.C. No. 742. Charles Scott, East Lilburn, West Lilburn, R.S.O.
H.C. No. 743. Charles Scott, East Lilburn, West Lilburn, R.S.O.

CLASS 88. SHEARLING TUP.—Premiums, £12, £8, £4, and £2.

1st. No. 751. Andrew T. Elliot, Newhall, Galashiels.
2nd. No. 752. Andrew T. Elliot, Newhall, Galashiels.
3rd. No. 753. Andrew T. Elliot, Newhall, Galashiels.
4th. No 746. John Bertram, Addinston, Lauder.
V.H.C. No. 745. John Bertram, Addinston, Lauder.
H.C. No. 759. Henry H. Scott, Alnham, Alnwick.
C. No. 748. John Bertram, Addinston, Lauder.

Best Half-Bred Female Pen in Classes 89, 90, *and* 91—£10, given by Breeders of Half-Bred Sheep, per Mr John Bertram.

No. 786. Robert Dickinson, Longcroft, Lauder.

CLASS 89. EWE, above one Shear.—Premiums, £10, £5, and £2.

1st. No. 775. Charles Scott, East Lilburn, West Lilburn, R.S.O.
2nd. No. 767. Alex. Crosbie, Blegbie, Upper Keith.
3rd. No. 769. William Elliot, Raecleugh Head, Duns.
V.H.C. No. 770. William Elliot, Raecleugh Head, Duns.
H.C. No. 776. Henry H. Scott, Alnham, Alnwick.
C. No. 773. James A. W. Mein, Hunthill, Jedburgh.

CLASS 90. SHEARLING EWE or GIMMER.—Premiums, £10, £5, and £2.

1st. No. 786. Robert Dickinson, Longcroft, Lauder.
2nd. No. 785. Robert Dickinson, Longcroft, Lauder.
3rd. No. 795. George Lowson, West Morriston, Earlston
V.H.C. No. 796. George Lowson, West Morriston, Earlston
H.C. No. 781. L. Morley Crossman, Goswick, Beal, R.S.O., Northumberland.
C. No. 788. William Elliot, Raecleugh Head, Duns.

CLASS 91. Three EWE LAMBS.—Premiums, £5, £3, and £2, given by Breeders of Half-Bred Sheep, per Mr John Bertram.

1st. No. 806. James A. W. Mein, Hunthill, Jedburgh.
2nd. No. 801. John Bertram, Addinston, Lauder
3rd. No. 807. C. H. Scott Plummer of Sunderland Hall, Selkirk
V.H.C. No. 802. Alex. Crosbie, Blegbie, Upper Keith.
H.C. No. 808. Charles Scott, East Lilburn, West Lilburn, R.S.O.

SHROPSHIRE.

PRESIDENT'S MEDAL for best Pen of Shropshires.

No. 811. David Buttar, Corston, Coupar-Angus

Reserve.

No. 810. David Buttar, Corston, Coupar Angus.

CLASS 92. TUP, above one Shear.—Premiums, £6, £4, and £2.

1st. No. 810. David Buttar, Corston, Coupar Angus

CLASS 93. SHEARLING TUP.—Premiums, £6, £4, and £2

1st. No. 811. David Buttar, Corston, Coupar-Angus
2nd. No. 812. David Buttar, Corston, Coupar Angus
3rd. No. 813. David Buttar, Corston, Coupar-Angus
V.H.C. No. 814 David Buttar, Corston, Coupar Angus
H.C. No. 815. David Buttar, Corston, Coupar Angus.
C. No. 816. David Buttar, Corston, Coupar Angus.
C. No. 818. Lord Polwarth, Humbie, Upper Keith

CLASS 94. EWE, above one Shear Premiums, £5, £3, and £2.

1st. No. 823. David Buttar, Corston, Coupar-Angus.
2nd. No. 826. The Earl of Strathmore, Home Farm, Glamis Castle, Glamis.
3rd. No. 822. David Buttar, Corston, Coupar Angus
H.C. No. 824. David Buttar, Corston, Coupar-Angus
C. No. 825. The Earl of Strathmore, Home Farm, Glamis Castle, Glamis.

CLASS 95. SHEARLING EWE or GIMMER.—Premiums, £5, £3, and £2

1st. No. 829. David Buttar, Corston, Coupar Angus.
2nd. No. 827. David Buttar, Corston, Coupar-Angus
3rd. No 833. The Earl of Strathmore, Glamis Castle, Glamis.
V.H.C. No. 834. The Earl of Strathmore, Glamis Castle, Glamis.
H.C. No 828. David Buttar, Corston, Coupar Angus.

OXFORD DOWNS.

PRESIDENT'S MEDAL for best pen of Oxford Downs.

No. 838. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.

Reserve.

No. 842. Peter Amos Langton, Gainford.

Class 96. SHEARLING TUP.—Premiums, £6, £4, and £2.

1st. No. 838. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.
2nd. No. 837. Peter Amos, Langton, Gainford.
3rd. No. 835. Peter Amos, Langton, Gainford.
V.H.C. No. 839. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.
H.C. No. 840. John C. Toppin, Musgrave Hall, Penrith.
C. No. 841. John C. Toppin, Musgrave Hall, Penrith.

Class 97. SHEARLING EWE or GIMMER.—Premiums, £5, £3, and £2.

1st. No. 842. Peter Amos, Langton, Gainford.
2nd. No. 844. Peter Amos, Langton, Gainford.
3rd. No. 845. The Right Hon. A. J. Balfour, M.P., Whittinghame, Prestonkirk.
V.H.C. No. 843. Peter Amos, Langton, Gainford.

SUFFOLK.

PRESIDENT'S MEDAL for best pen of Suffolk Sheep.

No. 851. The Earl of Ellesmere, Stetchworth Park, Newmarket.

Reserve.

No. 850. The Earl of Ellesmere, Stetchworth Park, Newmarket.

Class 98. TUP, any age.—£5, £3, and £2, given by the Suffolk Sheep Society.

1st. No. 851. The Earl of Ellesmere, Stetchworth Park, Newmarket.
2nd. No. 850. The Earl of Ellesmere, Stetchworth Park, Newmarket.
3rd. No. 852. The Earl of Ellesmere, Stetchworth Park, Newmarket.
H.C. No. 854. William Ford, Fentonbarns, Drem.
C. No. 849. John Ainslie, Temple Hall, Ormiston, East Lothian.

EXTRA SECTIONS.

Best Pen of Lambs in Class 102 *got by a Suffolk Tup*—Prize of £3, given by the Suffolk Sheep Society.

No. 874. The Earl of Ellesmere, Stetchworth Park, Newmarket.

Class 99. Three BLACKFACED WETHERS, one Shear.—Premiums, £5 and £3.

1st. No. 858. Sir John Gilmour of Montrave, Bart., Leven.
2nd. No. 860. John M'Dougal, Lylestone, Lauder.
V.H.C. No. 857. F. W. Christie, Dairsie Mains, Cupar-Fife.

Class 100. Three CHEVIOT WETHERS, one Shear.—Premiums, £5 and £3.

1st. No. 861. Alexander Guild, Greenhead, Pencaitland.
2nd. No. 862. H. W. Hope, Luffness Mains, Drem.
V.H.C. No. 863. John M'Dougal, Lylestone, Lauder.
H.C. No. 864. John Turnbull, Berryhill, Kelso.

Class 101. Three SHEARLING WETHERS, any Cross, out of Blackfaced Ewes.—Premiums, £5 and £3.

1st. No. 870. Trustees of late Mrs Nisbet, Allanshaws.
2nd. No. 867. F. W. Christie, Dairsie Mains, Cupar-Fife.
H.C. No. 869. John M'Dougal, Lylestone, Lauder.

Class 102. Five FAT LAMBS, any Breed or Cross.—Premiums, £5 and £3.

1st. No. 874. The Earl of Ellesmere, Stetchworth Park, Newmarket. (Suffolk.)
2nd. No. 872. Alexander Anderson, Berryhill, Dundee.
V.H.C. No. 875. John Fleming, Craigsford Mains, Earlston. (Oxford Down Ram and Half-bred Ewe.)
H.C. No. 873. Alexander Anderson, Berryhill, Dundee.

WOOL

BLACKFACE WOOL.

CLASS 103. BLACKFACE WETHER WOOL, five Fleeces.—Premiums, £3, £2, and £1. Given by Sir Robert Menzies, Bart.

1st. No. 881. James Willison, Acharn, Killin.
2nd. No. 882. John Willison, Kenknock, Glenlochay, Killin.

CLASS 104. BLACKFACE EWE WOOL, five Fleeces.—Premiums, £3, £2, and £1. Given by Sir Robert Menzies, Bart.

1st No. 892. James Willison, Acharn, Killin.
2nd No. 887. J. Macfarlane, Ashiestiel, Galashiels.
3rd. No. 884. Robert Dickinson, Longcroft, Lauder.
V.H.C. No 886. James Lumsden, Arden, Alexandria, N.B
H.C. No 893. John Willison, Kenknock, Glenlochay, Killin.
C. No. 885. R. C. Munro Ferguson, M P , Novar Home Farm, Evanton

CLASS 105. BLACKFACE EWE or WETHER HOGG WOOL, five Fleeces - Premiums, £3, £2, and £1. Given by Sir Robert Menzies, Bart.

1st. No 903. James Willison, Acharn, Killin.
2nd. No. 904 John Willison, Kenknock, Glenlochay, Killin
3rd. No. 902. Archibald Whyte, Glenmoy, Kirriemuir
V H.C No. 898. J. Macfarlane, Ashiestiel, Galashiels.
H.C No. 899. Lord Malcolm of Poltalloch, Poltalloch, Lochgilphead.
C. No 895. Robert Dickinson, Longcroft, Lauder

SWINE

PRESIDENT'S MEDAL for best Pen of Swine

No. 910. Sanders Spencer, Holywell Manor, St Ives, Hunts, "Holywell Model."

Reserve.

No. 925. J. Jefferson, Peel Hall, Chester, "Peel Lady" (5875).

LARGE WHITE BREED.

CLASS 106 BOAR —Premiums, £5 and £3

1st. No. 905. The Earl of Rosebery, K.G , Dalmeny Park, Edinburgh, "Bottesford Rover II" (4299)
2nd No. 907. Robert & Andrew Walker, East Craigs Farm, Corstorphine, "Ladas" (3575)

CLASS 107. SOW.—Premiums, £5 and £3.

1st. No. 910. Sanders Spencer, Holywell Manor, St Ives, Hunts, "Holywell Model."
2nd No 909. The Earl of Rosebery, K G , Dalmeny Park, Edinburgh, "Dalmony Empress XI."
H.C. No. 908. Richard Jacks, Ancrum Mains, Ancrum.
C No. 912. Robert & Andrew Walker, East Craigs Farm, Corstorphine, [illegible] "Countess" (5212)

CLASS 108. Three PIGS, not above 8 months old.—Premiums, £4 and £2.

1st.	No. 915.	Sanders Spencer, Holywell Manor, St Ives, Hunts.
2nd.	No. 914.	The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh.
H.C.	No. 916.	Robert & Andrew Walker, East Craigs Farm, Corstorphine.
C.	No. 917.	Robert & Andrew Walker, East Craigs Farm, Corstorphine.

WHITE BREED OTHER THAN LARGE.

CLASS 109. BOAR.—Premiums, £5 and £3.

1st.	No. 919.	Sanders Spencer, Holywell Manor, St Ives, Hunts, "Holywell Rosy Boy."
2nd.	No. 920.	Robert & Andrew Walker, East Craigs Farm, Corstorphine, "Dictator" (4497).

CLASS 110. SOW.—Premiums, £5 and £3.

1st.	No. 921.	Sanders Spencer, Holywell Manor, St Ives, Hunts.

CLASS 111. Three PIGS, not above 8 months old.—Premiums, £4 and £2.

1st.	No. 922.	Sanders Spencer, Holywell Manor, St Ives, Hunts.

BERKSHIRE.

CLASS 112. BOAR.—Premiums, £5 and £3.

1st.	No. 923.	J. Jefferson, Peel Hall, Chester, "Peel Swansea" (6231).
2nd.	No. 924.	J. Jefferson, Peel Hall, Chester, "Peel Duke" (6247).

CLASS 113. SOW.—Premiums, £5 and £3.

1st.	No. 925.	J. Jefferson, Peel Hall, Chester, "Peel Lady" (5875).
2nd.	No. 926.	J. Jefferson, Peel Hall, Chester, "Peel Queen" (6241).

CLASS 114. Three PIGS, not above 8 months old.—Premiums, £4 and £2.

1st.	No. 928.	J. Jefferson, Peel Hall, Chester.
2nd.	No. 927.	J. Jefferson, Peel Hall, Chester.

POULTRY

First Premium—*One Sovereign.* Second Premium—*Ten Shillings.* And where there are Six or more entries, Third Premiums—*Five Shillings.*

CHAMPION MEDALS.

1. *Best Cock, any variety.*

No. 44.	George Archibald, Blebo Craigs, by Cupar-Fife (Cochin-China).

2. *Best Hen, any variety.*

No. 27.	John Mechie, jun., miller, Auchtermuchty (Dorking, Silver Grey).

3. *Best Cockerel, any variety.*

No. 206.	Thomas Lockwood, Pateley Bridge, Yorkshire (Orpington).

4. *Best Pullet, any variety.*

No. 65.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff (Brahma).

5. *Best Pen of Waterfowl or Turkeys.*

No. 326.	A. Mansell, Crossrig, Penrith (Bronze).

Class 1. DORKING, Coloured. Cock.

1st.	No. 3.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 2.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 4.	David M'Gibbon, Ard-na-Craig, Campbeltown.

Class 2. DORKING, Coloured. Hen.

1st.	No. 6.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 7.	John Gillies, Edington Mills, Chirnside.

Class 3. DORKING, Coloured. Cockerel.

1st.	No. 9.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 10.	James Glen, 5 West Breast, Greenock.
C.	No. 8.	A. K. Crichton, Glamis.

Class 4. DORKING, Coloured. Pullet.

1st.	No. 12.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 13.	James Glen, 5 West Breast, Greenock.
H.C.	No. 14.	John M'Queen, Newton of Falkland, Falkland, Fife.

Class 5. DORKING, Silver Grey. Cock.

1st.	No. 17.	John Laing, Burnside, Auchtermuchty.
2nd.	No. 18.	John Laing, Burnside, Auchtermuchty.
3rd.	No. 15.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
H.C.	No. 19.	David M'Gibbon, Ard-na-Craig, Campbeltown.
C.	No. 16.	Robert Dickinson, Longcroft, Lauder.
C.	No. 20.	John Mechie, jun., miller, Auchtermuchty.

Class 6. DORKING, Silver Grey. Hen.

1st.	No. 27.	John Mechie, jun., miller, Auchtermuchty.
2nd.	No. 26.	David M'Gibbon, Ard-na-Craig, Campbeltown.
3rd.	No. 24.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
H.C.	No. 28.	John Mechie, jun., miller, Auchtermuchty.
C.	No. 30.	Thomas Rae, Craighlaw, Kirkcowan, Wigtownshire.

Class 7. DORKING, Silver Grey. Cockerel.

1st.	No. 34.	Thomas Rae, Craighlaw, Kirkcowan, Wigtownshire.
2nd.	No. 32.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
3rd.	No. 31.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
H.C.	No. 35.	William Reid, East Port Cottage, Falkland.
C.	No. 36.	James Shanks, Cuthelton Farm, Denny.

Class 8. DORKING, Silver Grey. Pullet.

1st.	No. 38.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
2nd.	No. 37.	Charles Aitkenhead, Stud Farm, Seaham Harbour.
3rd.	No. 43.	William Reid, East Port Cottage, Falkland.
H.C.	No. 42.	Thomas Rae, Craighlaw, Kirkcowan, Wigtownshire.

Class 9. COCHIN-CHINA. Cock.

1st.	No. 44.	George Archibald, Blebo Craigs, by Cupar-Fife.
2nd.	No. 45.	Robert M'Millan, Broon Coo Inn, Barrhead.

Class 10. COCHIN-CHINA. Hen.

1st.	No. 49.	Robert M'Millan, Broon Coo Inn, Barrhead.
2nd.	No. 46.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 47.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff.

Class 11. BRAHMAPOOTRA. Cock.

1st.	No. 51.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 52.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 53.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff.

CLASS 12. BRAHMAPOOTRA. Hen.

1st.	No. 55.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 57.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff.
H.C.	No. 54.	Mrs William Cæsar, Lochty, Carnoustie.
H.C.	No. 58.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff.
C.	No. 56.	John Gillies, Edington Mills, Chirnside.

CLASS 13. BRAHMA or COCHIN. Cockerel.

1st.	No. 61.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff (Brahma).
2nd.	No. 60.	John Gillies, Edington Mills, Chirnside (Brahma).
H.C.	No. 59.	John Gillies, Edington Mills, Chirnside (Brahma).

CLASS 14. BRAHMA or COCHIN. Pullet.

1st.	No. 65.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff (Brahma).
2nd.	No. 64.	D. J. Thomson Gray, Innerpeffray Lodge, Crieff (Brahma).
H.C.	No. 62.	John Gillies, Edington Mills, Chirnside (Brahma).

CLASS 15. SCOTCH GREY. Cock.

1st.	No. 70.	David M'Gibbon, Ard-na-Craig, Campbeltown.
2nd.	No. 68.	David Hastings, Glaister Cottage, Darvel.
3rd.	No. 69.	David M'Gibbon, Ard-na-Craig, Campbeltown.
H.C.	No. 72.	T. & J. Tweedie, Mouswald, Ruthwell, R.S.O.
C.	No. 67.	James Greenshields, West Town, Coalburn.

CLASS 16. SCOTCH GREY. Hen.

1st.	No. 74.	David M'Gibbon, Ard-na-Craig, Campbeltown.
2nd.	No. 75.	David M'Gibbon, Ard-na-Craig, Campbeltown.
H.C.	No. 73.	James Greenshields, West Town, Coalburn.

CLASS 17. SCOTCH GREY. Cockerel.

1st.	No. 79.	James Greenshields, West Town, Coalburn.
2nd.	No. 80.	David Hastings, Glaister Cottage, Darvel.

CLASS 18. SCOTCH GREY. Pullet.

1st.	No. 82.	James Greenshields, West Town, Coalburn.
2nd.	No. 83.	David Hastings, Glaister Cottage, Darvel.

CLASS 19. HAMBURG—Black. Cock.

1st.	No. 86.	A. M. Blair, Craigheads, Barrhead.
2nd.	No. 85.	A. M. Blair, Craigheads, Barrhead.
H.C.	No. 87.	John Gillies, Edington Mills, Chirnside.

CLASS 20. HAMBURG—Black. Hen.

1st.	No. 93.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 88.	A. M. Blair, Craigheads, Barrhead.
3rd.	No. 92.	J. & T. Ferguson, 7 Parkneuk, Dunfermline.
H.C.	No. 89.	A. M. Blair, Craigheads, Barrhead.
H.C.	No. 91.	J. & T. Ferguson, 7 Parkneuk, Dunfermline.

CLASS 21. HAMBURG—Any other Variety. Cock.

1st.	No. 95.	A. M. Blair, Craigheads, Barrhead (Golden spangled).
2nd.	No. 94.	A. M. Blair, Craigheads, Barrhead (Golden spangled).

CLASS 22. HAMBURG—Any other Variety. Hen.

1st.	No. 97.	A. M. Blair, Craigheads, Barrhead (Silver spangled).
2nd.	No. 100.	John Smith, jun., slater, Selkirk (Gold Pencil).
H.C.	No. 98.	A. M. Blair, Craigheads, Barrhead (Golden spangled).

CLASS 23. HAMBURG—Any Variety. Cockerel.

1st.	No. 102.	John Gillies, Edington Mills, Chirnside (Black).
2nd.	No. 101.	A. M. Blair, Craigheads, Barrhead (Silver spangled).

CLASS 24. HAMBURG—Any Variety. Pullet.

1st.	No. 104.	John Gillies, Edington Mills, Chirnside (Black).
2nd.	No. 103.	A. M. Blair, Craigheads, Barrhead (Silver).

CLASS 25. PLYMOUTH ROCK. Cock.

1st.	No. 105.	Mrs Black, Station House, Hillside, Montrose.
2nd.	No. 108.	Peter Houston, 27 High Street, Dumbarton.

CLASS 26. PLYMOUTH ROCK. Hen.

1st.	No. 110.	Alex. M. Prain, Rawes Farm, Longforgan.
2nd.	No. 111.	R. W. Robin, Craigton Cemetery Gate, Govan.
H.C.	No. 113.	Hon. Mrs Henry Scott, Brotherstone, St Boswells.

CLASS 27. PLYMOUTH ROCK. Cockerel.

1st.	No. 115.	James Hunter, Drumburn, New Abbey, Dumfries.
2nd.	No. 116.	R. W. Robin, Craigton Cemetery Gate, Govan.
H.C.	No. 114.	Mrs Elliot, Raecleugh Head, Duns.
C.	No. 117.	Hon. Mrs Henry Scott, Brotherstone, St Boswells.

CLASS 28. PLYMOUTH ROCK. Pullet.

1st.	No. 120.	L. H. Nutter, Burton, Carnforth.
2nd.	No. 119.	James Hunter, Drumburn, New Abbey, Dumfries.
H.C.	No. 121.	R. W. Robin, Craigton Cemetery Gate, Govan.

CLASS 29. MINORCA. Cock.

1st.	No. 126.	Mrs P. Elliot, Bonkyl Lodge, Duns.
2nd.	No. 129.	David M'Gibbon, Ard-na-Craig, Campbeltown.
3rd.	No. 125.	George Donald, Reveston House, Whitburn.
H.C.	No. 132.	Robert Reid, 706 New City Road, Glasgow.

CLASS 30. MINORCA. Hen.

1st.	No. 139.	David M'Gibbon, Ard-na-Craig, Campbeltown.
2nd.	No. 135.	George Deans, Hunterfield, Gorebridge.
3rd.	No. 148.	Richard A. Waugh, Dundas, South Queensferry.
H.C.	No. 149.	Welch & Bruce, 65 Crossgate, Cupar-Fife.
C.	No. 136.	Mrs P. Elliot, Bonkyl Lodge, Duns.

CLASS 31. MINORCA. Cockerel.

1st.	No. 150.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 151.	John Gillies, Edington Mills, Chirnside.
3rd.	No. 153.	Mrs A. Inglis, Montrose Stables, Lasswade.
H.C.	No. 159.	J. Smith, Dundas, South Queensferry.

CLASS 32. MINORCA. Pullet.

1st.	No. 161.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 162.	John Gillies, Edington Mills, Chirnside.
3rd.	No. 164.	Robert Jack, sen., Happy Hills, West Kilbride.

CLASS 33. LEGHORN—White. Cock.

1st.	No. 169.	Welch & Bruce, 65 Crossgate, Cupar-Fife.

CLASS 34. LEGHORN—White. Hen.

1st.	No. 171.	Welch & Bruce, 65 Crossgate, Cupar-Fife.

Class 35. LEGHORN—Any other Variety. Cock.

2nd.	No. 172.	Robert Allison, Little Inchgotery, by Kilmarnock (Brown).

Class 36. LEGHORN—Any other Variety. Hen.

2nd.	No. 173.	Robert Allison, Little Inchgotery, by Kilmarnock (Brown).

Class 37. LEGHORN—Any Variety. Cockerel.

1st.	No. 177.	Alex. M. Prain, Rawes Farm, Longforgan (White).
2nd.	No. 174.	Dickson Brothers, Mouswald, Ruthwell, R.S.O. (White).
3rd.	No. 175.	Joseph Guthrie, Craigo Forge, Montrose (White).
H.C.	No. 179.	Welch & Bruce, 65 Crossgate, Cupar-Fife (White).

Class 38. LEGHORN—Any Variety. Pullet.

1st.	No. 186.	Alex. M. Prain, Rawes Farm, Longforgan (White).
2nd.	No. 182.	Dickson Brothers, Mouswald, Ruthwell, R.S.O. (White).
3rd.	No. 183.	Robert Frew, The Barony, Cupar-Fife (White).

Class 39. LANGSHAN. Cock.

1st.	No. 193.	John Smith, jun., slater, Selkirk.
2nd.	No. 187.	J. & D. Alexander, Netherbeath, Crossgates, Fife.
3rd.	No. 192.	William Plenderleith, Rosewell Mains, Rosewell.
H.C.	No. 191.	Alexander Mackie, High Street, Freuchie, Fife.

Class 40. LANGSHAN. Hen.

1st.	No. 198.	William Plenderleith, Rosewell Mains, Rosewell.
2nd.	No. 194.	J. & D. Alexander, Netherbeath, Crossgates, Fife.
H.C.	No. 197.	Thomas H. T. Haxton, Bankfold Prize Poultry Farm, Auchterarder.

Class 41. ORPINGTON. Cock.

1st.	No. 199.	Thomas Lockwood, Pateley Bridge, Yorkshire.
2nd.	No. 200.	Alex. M. Prain, Rawes Farm, Longforgan.
H.C.	No. 201.	R. W. Robin, Craigton Cemetery Gate, Govan.

Class 42. ORPINGTON. Hen.

1st.	No. 204.	Thomas Lockwood, Pateley Bridge, Yorkshire.
2nd.	No. 202.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 203.	John Glassford, Halfway House, Paisley Road, by Govan.

Class 43. LANGSHAN or ORPINGTON. Cockerel.

1st.	No. 206.	Thomas Lockwood, Pateley Bridge, Yorkshire (Orpington).
2nd.	No. 207.	Alex. M. Prain, Rawes Farm, Longforgan (Orpington).
H.C.	No. 205.	F. Joynson, Murraythwaite, Ecclefechan (Langshan).

Class 44. LANGSHAN or ORPINGTON. Pullet.

1st.	No. 209.	F. Joynson, Murraythwaite, Ecclefechan (Langshan).
2nd.	No. 210.	Thomas Lockwood, Pateley Bridge, Yorkshire (Orpington).

Class 45. WYANDOTTE—Gold or Silver. Cock.

1st.	No. 215.	Thomas Hume, Lees Mills, Coldstream (Gold).
2nd.	No. 216.	Thomas Lockwood, Pateley Bridge, Yorkshire (Silver).
3rd.	No. 212.	A. M. Blair, Craigheads, Barrhead (Gold).
C.	No. 218.	Andrew Stillie, Forest Road, Selkirk (Gold).

Class 46. WYANDOTTE—Gold or Silver. Hen.

1st.	No. 225.	Mrs Kinnaird, Clockmill, Duns (Silver).
2nd.	No. 226.	Thomas Lockwood, Pateley Bridge, Yorkshire (Silver).
3rd.	No. 221.	A. W. Forrester, Gaberston, Alloa (Silver).
H.C.	No. 228.	William Pugsley, 32 Bradley Cottages, Leadgate, County Durham (Silver).

CLASS 47. WYANDOTTE—Any other Variety. Cock.

2nd.	No. 229.	H. Maidment, Lanercost, Brampton, Cumberland (Buff).

CLASS 48. WYANDOTTE—Any other Variety. Hen.

1st.	No. 231.	Thomas Lockwood, Pateley Bridge, Yorkshire (White).
2nd.	No. 230.	T. & W. Hope, Banks, Brampton, Cumberland (White).
H.C.	No. 232.	H. Maidment, Lanercost, Brampton, Cumberland (Buff).

CLASS 49. WYANDOTTE—Any Variety. Cockerel.

1st.	No. 234.	Mrs William Cæsar, Lochty, Carnoustie (Silver).
2nd.	No. 233.	Mrs William Cæsar, Lochty, Carnoustie (Silver).
3rd.	No. 237.	Thomas Lockwood, Pateley Bridge, Yorkshire (Silver).
H.C.	No. 238.	H. Maidment, Lanercost, Brampton, Cumberland (Silver)

CLASS 50. WYANDOTTE—Any Variety. Pullet.

1st.	No. 245.	John Love, 100 South Street, Armadale Station.
2nd.	No. 243.	Peter Kinnear, Brook Street, Broughty Ferry.
3rd.	No. 241.	Mrs William Cæsar, Lochty, Carnoustie (White).
H.C.	No. 246.	H. Maidment, Lanercost, Brampton, Cumberland (Silver).

CLASS 51. GAME—Old English. Cock—*No Entry.*

CLASS 52. GAME—Old English. Hen—*No Entry.*

CLASS 53. GAME—Indian. Cock.

2nd.	No. 248.	James Davie, Inglis Street Bakery, Dunfermline.

CLASS 54. GAME—Indian. Hen.

2nd.	No. 249.	James Davie, Inglis Street Bakery, Dunfermline.

CLASS 55. GAME—Modern. Cock.

1st.	No. 251.	William Melrose, Rosewell Mains, Rosewell (Black Red).
2nd.	No. 250.	James Hilson, Hutton, Berwick-on-Tweed (Pile).

CLASS 56. GAME—Modern. Hen.

1st.	No. 253.	William Melrose, Rosewell Mains, Rosewell (Black Red).
2nd.	No. 252.	James Hilson, Hutton, Berwick-on-Tweed (Pile).

CLASS 57. GAME—Any Variety, including Old English and Indian. Cockerel.

1st.	No. 255.	William Melrose, Rosewell Mains, Rosewell (Black Red).
2nd.	No. 256.	Robert Reid, Glasgow Bridge, Kirkintilloch (Pile).
C.	No. 254.	Mrs James Davie, Inglis Street, Dunfermline (Indian).

CLASS 58. GAME—Any Variety, including Old English and Indian. Pullet.

1st.	No. 258.	William Melrose, Rosewell Mains, Rosewell (Black Red).
2nd.	No. 259.	Robert Reid, Glasgow Bridge, Kirkintilloch (Pile).
H.C.	No. 257.	Mrs James Davie, Inglis Street, Dunfermline (Indian).

CLASS 59. BANTAM—Game, any Variety, including Old English and Indian. Cock—*No Entry.*

CLASS 60. BANTAM—Game, any Variety, including Old English and Indian. Hen—*No Entry.*

CLASS 61. BANTAM—Any other Variety Bantam. Cock.

1st.	No. 260.	Mrs Frew, The Barony, Cupar-Fife (Frizzle).
2nd.	No. 262.	George Huntly, Paxton, Berwick-on-Tweed (Black).
H.C.	No. 263.	Dr A. Richmond, 9 St James Place, Paisley (Sebright).

CLASS 62. BANTAM—Any other Variety Bantam. Hen.

1st.	No. 264.	Miss Frew, The Barony, Cupar-Fife (Sebright).
2nd.	No. 266.	Dr A. Richmond, 9 St James Place, Paisley (Black).
C.	No. 265.	John Gillies, Edington Mills, Chirnside (Sebright).

CLASS 63. Any other recognised Breed of Poultry. Cock.

1st.	No. 269.	David M'Gibbon, Ard-na-Craig, Campbeltown (Spanish).
2nd.	No. 267.	Peter Houston, 27 High Street, Dumbarton (Andalusian).
H.C.	No. 268.	Peter Johnstone, Ladybank, Fife (Andalusian).

CLASS 64. Any other recognised Breed of Poultry. Hen.

1st.	No. 274.	David M'Gibbon, Ard-na-Craig, Campbeltown (Spanish).
2nd.	No. 271.	David Hastings, Glaister Cottage, Darvel (Crere).
3rd.	No. 272.	Peter Houston, 27 High Street, Dumbarton (Andalusian).
H.C.	No. 270.	Mrs James Davie, Inglis Street, Dunfermline (Malay).

CLASS 65. Any other recognised Breed of Poultry. Cockerel—*No Entry.*

CLASS 66. Any other recognised Breed of Poultry. Pullet.

1st.	No. 277.	Mrs D. Mackenzie, Maryfield, Meigle (Spanish).
2nd.	No. 276.	Thomas Lockwood, Pateley Bridge, Yorkshire (Andalusian).

CLASS 67. DUCKS—Aylesbury. Drake.

1st.	No. 279.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 278.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 280.	Mrs A. P. Hope, Sunwick, Berwick.

CLASS 68. DUCKS—Aylesbury. Duck.

1st.	No. 285.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 284.	John Gillies, Edington Mills, Chirnside.
3rd.	No. 288.	James Paterson, Kidshielhaugh, Duns.

CLASS 69. DUCKS—Aylesbury. Drake (Young).

1st.	No. 290.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 291.	John Gillies, Edington Mills, Chirnside.
C.	No 293.	The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh.

CLASS 70. DUCKS—Aylesbury. Duck (Young).

1st.	No. 294.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 295.	John Gillies, Edington Mills, Chirnside.
C.	No. 297.	The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh.

CLASS 71. DUCKS—Rouen. Drake.

1st.	No. 300.	Peter Houston, 27 High Street, Dumbarton.
2nd.	No. 298.	John Gillies, Edington Mills, Chirnside.

CLASS 72. DUCKS—Rouen. Duck.

1st.	No. 304.	John Gillies, Edington Mills, Chirnside.
2nd.	No. 303.	John Gillies, Edington Mills, Chirnside.
H.C.	No. 305.	Peter Houston, 27 High Street, Dumbarton.

CLASS 73. DUCKS—Any other Variety. Drake.

1st.	No. 308.	S. Dalgleish, Blackburn, Chirnside (Pekin).
2nd.	No. 312.	Lady Wilson, Chillingham Barns, Belford, Northumberland (Cayuga).
H.C.	No. 309.	John Gillies, Edington Mills, Chirnside (Pekin).
C.	No. 310.	The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh (Indian Runner).

CLASS 74. DUCKS—Any other Variety. Duck.

1st.	No. 313.	S. Dalgleish, Blackburn, Chirnside (Pekin).
2nd.	No. 316.	Lady Wilson, Chillingham Barns, Belford, Northumberland (Cayuga).
C.	No. 315.	Hon. Mrs Henry Scott, Brotherstone, St Boswells (Yorkshire Blue).

CLASS 75. DUCKS—Any Breed (Aylesbury excepted). Drake (Young).

1st.	No. 318.	John Gillies, Edington Mills, Chirnside (Rouen).
2nd.	No. 319.	John Gillies, Edington Mills, Chirnside (Rouen).
H.C.	No. 317.	Dickson Brothers, Mouswald, Ruthwell, R.S.O. (Pekin).

CLASS 76. DUCKS—Any Breed (Aylesbury excepted). Duck (Young).

1st.	No. 320.	Dickson Brothers, Mouswald, Ruthwell, R.S.O. (Pekin).
2nd.	No. 322.	John Gillies, Edington Mills, Chirnside (Rouen).
H.C.	No. 321.	John Gillies, Edington Mills, Chirnside (Rouen).

CLASS 77. GEESE. Gander.

1st.	No. 323.	William Crawford, Disdow Farm, Gatehouse of Fleet (Toulouse).
2nd.	No. 324.	A. Enever Todd, Stoneybank, Musselburgh (Embden).

CLASS 78. GEESE. Goose.

1st.	No. 325.	A. Enever Todd, Stoneybank, Musselburgh (Embden).

CLASS 79. TURKEYS. Cock.

1st.	No. 326.	A. Mansell, Crossrig, Penrith (Bronze).
2nd.	No. 328.	Lady Wilson, Chillingham Barns, Belford, Northumberland (Bronze).
H.C.	No. 327.	Miss Shanks, Cuthelton Farm, Denny (Bronze).

CLASS 80. TURKEYS. Hen.

1st.	No. 335.	Lady Wilson, Chillingham Barns, Belford, Northumberland (Bronze).
2nd.	No. 334.	Miss Shanks, Cuthelton Farm, Denny (Bronze).
3rd.	No. 331.	William Crawford, Disdow Farm, Gatehouse of Fleet (Bronze).
H.C.	No. 332.	A. S. Hay, Marlefield, Roxburgh (White).
C.	No. 333.	The Earl of Rosebery, K.G., Dalmeny Park, Edinburgh (Bronze).

DAIRY PRODUCE

CLASS 1. CURED BUTTER, not less than 7 lb.—Premiums, £4, £2, and £1.

1st.	No. 3.	Robert Gilmour, Stonebyres, Eaglesham.
2nd.	No. 7.	Henry Orr, Torrance, Blackridge, Westcraigs.
3rd.	No. 9.	W. Whyte, Middlepenny, Langbank.
V.H.C.	No. 1.	William Duncan, Middlerigg, Polmont Station.
V.H.C.	No. 2.	Andrew Fleming, Threepland, Eaglesham.
H.C.	No. 6.	David Longwill, Kendieshill, Linlithgow.
C.	No. 8.	George Wallace, Kinglass Farm, Bo'ness.

CLASS 2. POWDERED BUTTER, not less than 7 lb.—Premiums, £4, £2, and £1.

1st.	No. 14.	Robert Gilmour, Stonebyres, Eaglesham.
2nd.	No. 18.	W. Whyte, Middlepenny, Langbank.
3rd.	No. 12.	Andrew Fleming, Threepland, Eaglesham.
H.C.	No. 15.	David Longwill, Kendieshill, Linlithgow.
C.	No. 16.	Henry Orr, Torrance, Blackridge, Westcraigs.

CLASS 3. FRESH BUTTER, Three 1-lb. Rolls.—Premiums, £4, £2, and £1.

1st. No. 24. Robert Gilmour, Stonebyres, Eaglesham.
2nd. No. 22. Andrew Fleming, Threepland, Eaglesham.
3rd. No. 29. Henry Orr, Torrance, Blackridge, Westcraigs.
V.H.C. No. 20. William Duncan, Middlerigg, Polmont Station.
V.H.C. No. 33. W. Whyte, Middlepenny, Langbank.
H.C. No. 28. David Longwill, Kendieshill, Linlithgow.
C. No. 32. George Wallace, Kinglass Farm, Bo'ness.

CLASS 4. CHEDDAR CHEESE, 56 lb. and upwards.—
Premiums, £6, £4, £2, and £1.

1st. No. 37. Robert Montgomerie, Lessnessock, Ochiltree.
2nd. No. 38. Matthew Templeton, Drumore, Kirkcudbright.
3rd. No. 36. James Ferguson, Auchlane, Castle-Douglas.
4th. No. 34. Alexander Cross, Knockdon, Maybole.

HORSE-SHOEING

OPEN TO SHOEING-SMITHS FROM ANY PART OF THE UNITED KINGDOM.

Thursday, 7th July, at 10 a.m.

CLASS 1. DRAUGHT HORSES.—Premiums, £3, £2, and £1.

1. William Pow, Borthwickbrae, Hawick.
2. James Low, Knowhead, Cupar-Fife.
3. Robert Marshall, Gateside, Beith.
V.H.C. George Reid, Baillieston.

Friday, 8th July, at 10 a.m.

CLASS 2. ROADSTERS.—Premiums, £3, £2, and £1.

1. George Reid, Baillieston.
2. Alexander Allan, Peacock Cross, Hamilton.
3. Edward Griffiths, Eamont, Penrith, Cumberland.
V.H.C. William White, Dalmuir, Glasgow.

Special Prize of £2, given by Sir James H. Gibson-Craig of Riccarton, Bart., for combined quickness and workmanship on Thursday.

Alexander Allan, Peacock Cross, Hamilton.

JUDGES

Shorthorn.—W. T. Malcolm, Dunmore Home Farm, Larbert; George Ashburner, Low Hall, Kirkby-in-Furness.

Aberdeen-Angus.—W. S. Ferguson, Pictstonhill, Perth; William Whyte, Hatton of Eassie, Glamis.

Galloway.—James Biggar, Grange Farm, Dalbeattie; William Stroyan, Culcaigrie, Twynholm.

Highland.—Robert Macdiarmid, Castles, Lochawe.

Ayrshire.—John Murray, jun., Carston, Ochiltree.

Stallions, Entire Colts, and Draught Geldings.—Andrew Ralston, Glamis; Robert Stevenson, Hillside, Campbeltown; Robert Renwick, Buchley, Bishopbriggs.

Mares and Fillies.—William Renwick, Meadowfield, Corstorphine; John Morrison, Hattonslap, Old Meldrum; George Bean, West Ballochy, Montrose.

Hunters.—W. Forbes of Callendar, Falkirk; G. Cunard, Thorpe Lubenham, Market Harborough.

Hackneys, Roadsters, and Ponies.—T. H. Hutchinson, Manor House, Catterick.

Shetland Ponies.—James Duncan, Fern Villa, Inverness.

Blackfaced.—James Greenshields, West Town, Lesmahagow; Duncan M'Diarmid, Camusericht, Rannoch Station; John Craig, South Halls, Strathaven.

Cheviot.—Andrew T. Elliot, Newhall, Galashiels; James Brydon, Nether Ervie, Parton, Galloway.

Border Leicester.—Andrew Smith, Longniddry; John Twentyman, Hawkrigg House, Wigton, Cumberland

Half-Bred.—John Riddell, The Rink, Galashiels; James Bertram, Heugh Head, Reston.

Shropshire, Oxford Down, and Suffolk.—Alfred Mansell, College Hill, Shrewsbury.

Fat Sheep.—James Swan, Lauriston Place, Edinburgh.

Swine.—John Angus, Whitefield, Morpeth.

Poultry.—D. Bragg, Southwaite Hall, Carlisle.

Dairy Produce.—James Weir, 71 Brunswick Street, Glasgow.

Wool.—Alex. Campbell, 40 Hydepark Street, Glasgow; Alex. Willison, Easterhill, Dalry, Ayrshire.

Horse-Shoeing—Principal Dewar, Royal (Dick) Veterinary College, Edinburgh.

ATTENDING MEMBERS

Shorthorn.—Robert Paterson, Alexander Lyall, John Bruce.

Aberdeen-Angus.—C. M. Cameron, Mark Turnbull, P. Stormonth Darling.

Galloway.—William Ford, J. A. Somervail, Thomas Gibson, jun.

Highland.—Sir Robert Menzies, R. C. Smith John Caverhill.

Ayrshire.—R. F. Dudgeon, John Elliot, James Grieve, jun.

Stallions, Entire Colts, and Draught Geldings.—William Duthie, George Dun, Captain Clayhills Henderson, John S. Johnston, Alexander White.

Mares and Fillies.—John M. Martin, John Macpherson Grant, John M'Hutchen Dobbie, Jas. Nisbet, Adam S. Logan, Allan Stevenson.

Hunters.—Sir Ralph Anstruther, John Bertram, T. Scott Anderson, H. M. Leadbetter, C. G. Sinclair.

Hackneys.—David Wilson, jun., C. J. Cunningham, Colonel D. Milne Home, W. A. Calder.

Roadsters and Ponies.—George W. Constable, C. H. Scott Plummer, John Scott, James Wylie, Edinburgh.

Shetland Ponies.—W. H. Lumsden, Provost Smith, T. D. Crichton Smith.

Blackfaced.—John Speir, John Marr, J. R. C. Smith, G. D. Ritchie.

Cheviot.—John Clay, Andrew Haddon, John Robson Scott.

Border Leicester.—John Wilson, A. Peterkin Hope, F. H. Everett.

Half-Bred.-Dr Shirra Gibb, Robert Henderson, William Ballantyne.

Shropshire, Oxford Down, and Suffolk.—John Cran, George Forest, James Porteous.

Fat Sheep.—Andrew Hutcheson, George Ballingall, James Maxwell.

Swine.—John Scott Dudgeon, H. Peckett Huie.

Poultry.—John C. Scott, John Sword.

Dairy Produce.—C. Howatson.

Wool.—John M'Caig, John Dun, F. W. Dyson

Horse-Shoeing.—Sir James H. Gibson-Craig, John M'Hutchen Dobbie, Dr Shirra Gibb, John Bertram, Allan Stevenson, William Hardy, jun., Harpertoun, Kelso.

III.—DISTRICT COMPETITIONS.

CATTLE, HORSES, AND SHEEP.

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
Morayshire	James M'William, Stoneytown	Shorthorn Bull	£3 0 0
	George Williamson, Elgin	do.	1 10 0
	Gordon R. Shiach, Morriston	Hackney Entire Colt	3 0 0
	Alexander Leslie of Braco	do. Mare	1 10 0
	William Cumming, Allanfearn	Leicester Tup	2 0 0
	James M'William, Stoneytown	do.	1 0 0
Buchan	Alexander Beddie, Banks	Aberdeen-Angus Bull	1 10 0
	Colonel Ferguson, Pitfour	do. do.	1 0 0
	George Watson, Outhill Rora	do. do.	0 10 0
	James Bruce, Inverquhomery	Shorthorn Bull	1 10 0
	W. E. Hutchison, Cairngall	do. do.	1 0 0
	William Milne, Longside	do. do.	0 10 0
	James Bruce, Inverquhomery	do. Heifer	1 10 0
	James Bruce, Inverquhomery	do. do.	1 0 0
	W. E. Hutchison, Cairngall	do. do.	0 10 0
	John P. Sleigh, Hillhead	Clydesdale Mare and Foal	1 10 0
	James Philip, Clayfords	do. do.	1 0 0
	Dr Ferguson, Kinmundy	do. do.	0 10 0
Royal Northern	W. H. Lumsden of Balmedie	Clydesdale Filly	6 0 0
	James Fleming, Friock Mains	do. Colt	6 0 0
Mid-Annandale	Robert Paterson of Robgill Tower	do. Mare	4 0 0
	Robert Paterson of Robgill Tower	do. Yeld Mare	4 0 0
	T. & J. Gass, Hillhead	do. two-year-old Filly	2 0 0
	James Crawford, Floshend	do. one-year-old do.	2 0 0
Inverurie	James Durno, Easterton	Aberdeen-Angus Bull	1 10 0
	J. & J. G. Stephen, Conglass	do. do	1 0 0
	Alex. M. Gordon of Newton	Shorthorn Bull	1 10 0
	Alex. M. Gordon of Newton	do. do.	1 0 0
	G. & J. Cocker, Hill of Petty	Clydesdale Mare	1 10 0
	William Ferguson, Lumphart	do. do.	1 0 0
	G. & J. Cocker, Hill of Petty	do. Filly	1 10 0
	James Durno, Jackston	do do.	1 0 0
	Robert Cowie, Newlands	Leicester Tup	1 0 0
	James M'Glashan, Fawells	do. Ewe	1 0 0
Kintyre	For Pure-bred Stock		12 0 0
St Mary's Isle Estates and District	Andrew Mitchell, Barcheskie	Clydesdale Mare and Foal	2 0 0
	A. & W. Montgomery, Banks	do. Yeld Mare	2 0 0
	James M'Queen of Crofts	do. Mare	2 0 0
	A. & W. Montgomery, Banks	do. two-year-old Filly	2 0 0
	John Montgomery, Compstonend	do. one-year-old do.	2 0 0
	A. & W. Montgomery, Banks	do. two-year-old Colt	2 0 0
Carnwath	William Aitken, Lewnside	Ayrshire Cow	1 10 0
	John Muir, Townhead	Ayrshire Cow	1 10 0
	T. P. Somerville, Muirhouse	Clydesdale Mare and Foal	1 10 0
	T. P. Somerville, Muirhouse	Clydesdale Mare	1 10 0
	Rev. John Picken, M.A., Libberton	Roadster Mare	1 10 0
	John Brown, Muirhouse	Ayrshire Bull	1 10 0
	John Thorburn, Henshielend	Leicester Tup	1 10 0
	John Sandilands, Greens	Blackfaced Tup	1 10 0
		Carry forward	£96 0 0

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward .	£96 0 0
Breadalbane	James M'Kinlay, Balnahanaid	Clydesdale Mare	1 0 0
	Duncan M'Intyre, Daldravaig	Highland Bull	1 10 0
	Duncan Robertson, Moar	do.	1 5 0
	John Cameron, Easter Ardchyle	do.	1 0 0
	Peter Fisher, Braes of Ardeonaig	Blackfaced Tup	1 10 0
	M'Martin & M'Ainsh, Inverardran	do.	0 15 0
	Donald Robertson, Moierlanich	Ayrshire Bull	1 5 0
	Donald Robertson, Moierlanich	do.	1 5 0
	Peter M'Martin, Duallin	Shorthorn Bull	1 5 0
	James Menzies, Finlarig	Aberdeen-Angus Bull . .	1 5 0
Wester Ross	T. A. Anderson, Ballachraggan	Mare and two of her Progeny	2 0 0
	Robert Macfarlane, Tomich	Draught Filly	1 0 0
	W. & J. Peterkin, Dunglass	Shorthorn Cow and two of her Progeny	2 0 0
	C. M. Cameron, Balnakyle	Shorthorn Heifer	1 0 0
	W. A. Cumming, Allanfearn	Leicester Tup	1 0 0
	Walter Mundell, Moy	Cheviot Tup	1 0 0
	James A. Gordon of Arabella	Blackfaced Tup	1 0 0
Stranraer and Rhins of Galloway	William Gibson, Beoch	do.	1 0 0
	J. & R. Hewetson, Balterson	Border Leicester Tup . .	1 0 0
	William Murray, Borrowmoss	Ayrshire Cow	1 0 0
	John F. Niven, Mahaar	do. Bull	1 0 0
	Matthew Marshall, Stranraer	Clydesdale one-year-old Colt	3 0 0
	Provost Matthews, Newton-Stewart	do. two-year-old Filly	3 0 0
	Hugh Caldwell. Stranraer	Roadster Gelding	2 0 0
Aberdour	Alex. Taylor, Bonnytonhill	Aberdeen-Angus Bull	Silver Medal
	John Bell, Tyrie Mains	Clydesdale Mare	do.
	Alexander Milne, Knowhead	Leicester Tup	do.
Vale of Alford	George G. Littlejohn, Wellhouse	Aberdeen-Angus Bull	do.
	William A. Mitchell, Auchnagathle	Shorthorn Bull	do.
	William A. Mitchell, Auchnagathle	Shorthorn Heifer	do.
Caithness	William Moore, Ormlie	Draught Mare with Foal at foot	do.
	Donald Innes, Sandside	Aberdeen-Angus Cow	do.
	William Clyne, Noss	Cheviot Ewes	do.
Dalkeith	William Park, Brunstane	Clydesdale Brood Mare	do.
	William Park, Brunstane	do. Filly	do.
	Alexander Guild, Greenhead	Clydesdale two-year-old Filly	do.
Black Isle	C. M. Cameron, Balnakyle	Shorthorn Bull	do.
	J. Douglas Fletcher of Rosehaugh	Clydesdale Mare	do.
	J. Douglas Fletcher of Rosehaugh	Border Leicester Tup	do.
Kinglassie	John Paton, Kirkness	Clydesdale Brood Mare	do.
	R. & J. W. Thornton, North Pitkinnie	Shorthorn Bull	do.
	David Normand, Dalginch	Leicester Tup	do.
		Carry forward	£129 0 0

NAME OF DIST.	PREMIUM AWARDED TO	FOR	AMOUNT.
		Brought forward	£129 0 0
Weem	Alex. Robertson, Ballechin	Brood Mare	Silver Medal
	Duncan M'Donald, Comrie Farm	Shorthorn Bull	do.
	Marquis of Breadalbane, K.G., Taymouth Castle	Blackfaced Tup	do.
Nithsdale	Alex. Y. Allan, Croftjane	Ayrshire Bull	do.
	Homer Young, Redhills	Clydesdale Gelding	do.
	Donald M. Mackae, Stenhouse	Blackfaced Tup	do.
Kirriemuir	James Sim, Kilnhill	Clydesdale Brood Mare	do.
	Sir Leonard Lyell of Kinnordy, Bart.	Aberdeen-Angus Cow	do.
	William Rough, Loughank	Blackfaced Ewes	do.
Sutherland	J. Mackintosh, Proncy	Clydesdale Mare	do.
	J. B. Dudgeon, Crakaig	Shorthorn Bull	do.
	Duncan Menzies, Blarich	Cheviot Tup	do.
Argyll	J. Campbell of Kilberry	Highland Cow	do.
	B. & J. Mundell, Auchnacarnan	Ayrshire Bull	do.
	Neil Nicolson, Auchgoyle	Clydesdale Mare	do.
Carrick	Wm. Dunlop, Dunure Mains	Blackfaced Tup	do.
	Neil M'Naughton, Laigh	Ayrshire Heifer	do.
	Wm. Dunlop, Dunure Mains	Clydesdale Brood Mare	do.
Forth	John Lawson, Guildhouse	Ayrshire Cow	do.
	Mrs Wilson, Roadhead	Clydesdale Filly	do.
	James Hamilton, Woolfords	Blackfaced Tup	do.
Lower Ward of Renfrewshire	A. & W. Montgomery, Banks	Stallion	15 0 0
Lauderdale	D. Riddell, Blackhall	Stallion	15 0 0
Kincardineshire (Northern District)	Alex. M'Robbie, Sunnyside	Stallion	15 0 0
Orkney Horse-Breeding	Orkney Horse-Breeding Society	Stallion	15 0 0
Strathearn (Central)	A. & W. Montgomery, Banks	Stallion	15 0 0
Mid-Lothian (Western District)	Mrs Curr, Merrylee Farm	Stallion	15 0 0
Stirling District	A. & W. Montgomery, Banks	Stallion	15 0 0
Dumbartonshire	James Lockhart, Mains of Airies	Stallion	15 0 0
Selkirk and Galashiels	Alex. M'Robbie, Sunnyside	Stallion	15 0 0
			£264 0 0
		39 Large Silver Medals	24 17 3
			£288 17 3

DAIRY PRODUCE.

Lochbroom	Christina MacLeod, Rhue	Salt Butter	Silver Medal
Horticultural	Margt. MacKenzie, Strathcanard	Warm Milk Cheese	do.

SPECIAL GRANTS.

Highland Home Industries and Arts Association	Grant	£40	0	0
Ayrshire Agricultural Association	Vote to Dairy Show at Kilmarnock	20	0	0
Shetland Agricultural Society	Vote in aid of Premiums . . .	5	0	0
Orkney Agricultural Society	do. do. . . .	3	0	0
East Mainland Agricultural Society	do. do. . . .	3	0	0
		£71	0	0

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

Silver Medals were awarded to the following:—

ABERDEENSHIRE.

NAME OF DIST.	SILVER MEDAL AWARDED TO	FOR
Deeside Union	Alexander W. Still, Nether Auguston	Shorthorn Bull
	John Davidson, Harestone	Aberdeen-Angus Bull
Fyvie	James Durno, Jackstown	Shorthorn Cow
	G. & J. Cocker, Hill of Petty	Clydesdale Mare
Kennethmont	Colonel Leith Hay of Leithhall	Shorthorn Bull
	Robert Harper, Mellinside	Clydesdale Filly
Monquhitter	James Fowlie, Brucehill	Aberdeen-Angus Bull
	John Gray, Blairfowl	Clydesdale Filly

ARGYLLSHIRE.

Mull and Morvern	A. Ferguson, Lochaline	Highland Cow
	Major Morris, Glenmorven	Cheviot Tup
Nether Lorn	Mrs Margaret M'Calman, Ardincaple	Clydesdale Mare
	Allan Hall, Ardmaddy	Blackfaced Shearling Tup

AYRSHIRE.

Beith	Hugh Waterston, Beith	Ayrshire Cow
	William Hastings, Peacockbank	Clydesdale Mare
Colmonell and Ballantrae	C. & R. Wilson, Auchenflower	Ayrshire Cow
	William M'Neil, Bigpark	Clydesdale Mare
Dalry	John Allan, West Bankside	Clydesdale Gelding
	James Templeton, Hindoe	Ayrshire Bull
Kilbirnie	Mrs Sommerville, Burnside	Ayrshire Cow
	William Kerr, Greenridge	Leicester Tup

BUTE.

Bute	R. & J. M'Alister, Mid Ascog	Ayrshire Cow
	R. & J. M'Alister, Mid Ascog	Clydesdale two-year-old Colt

INVERNESS-SHIRE.

Lochaber	D. & S. Cameron, Tulloch	Blackfaced Ewes
	Donald Campbell, Blarmacfoldach	Highland Heifer

STEWARTRY OF KIRKCUDBRIGHT.

Carsphairn	J. Craig, Moor	Blackfaced Tup and Ewe
	Miss Bell, Braidneugh	Fresh Butter

LANARKSHIRE.

NAME OF DIST.	SILVER MEDAL AWARDED TO	FOR
Shettleston and Chryston	John Steel, Lochwood	Ayrshire Bull
	Alexander Murdoch, Gartcraig	Clydesdale Gelding
Shotts, Calderwaterhead	John Lawson, Guildhouse	Ayrshire Cow
	John Weir, Townhead	Clydesdale Filly
	PERTHSHIRE.	
Ardoch	Captain Drummond, Cromlix	Aberdeen-Angus Bull
	Colonel Stirling of Kippendavie	Clydesdale Mare
Moulin	John Caddell, Coilvoulin	Roots
	ROSS-SHIRE.	
Easter Ross	John Ross, Meikle Tarrel	Shorthorn Bull
	R. Macfarlane, Tomich	Clydesdale Filly
	RENFREWSHIRE.	
Lochwinnoch	Patrick Coul, Auchenbean	Ayrshire Bull
	Robert Fyfe, East Gavin	Clydesdale Gelding
	STIRLINGSHIRE.	
Denny and Dunipace	R. Anderson, Wester Seamores	Clydesdale Brood Mare
	George Park, Bankend	Ayrshire Heifer
Eastern District of Stirlingshire	W. T. Malcolm, Dunmore Home Farm	Shorthorn Bull
	James Fleming, Carmuirs	Leicester Tup

43 Large Silver Medals, £27, 8s. 3d.

PLOUGHING COMPETITIONS.

In 1897-98 the Society's Silver Medal was awarded at 212 Ploughing Competitions.

212 Minor Silver Medals, £51, 4s. 8d.

IV.—COTTAGES AND GARDENS, AND BEE-KEEPING.

46 Minor Silver Medals	£11	2	4

V.—VETERINARY DEPARTMENT.

CLASS EXAMINATIONS—1898.

Silver Medals were awarded to the following:—

ROYAL (DICK) VETERINARY COLLEGE.

C. A. Reid	Comparative Medicine	W. Girvan	Hygiene
Wm. Tart	Obstetrics	T. J. Keall	Chemistry
Wm. Hepburn	Senior Anatomy	W. T. Dunstan	Practical Chemistry
G. E. Anderson	Junior Anatomy	G. E. Anderson	Botany
W. S. King	Pathology	R. A. Edwards	Physiology
A. J. Williams	Surgery	W. S. King	Materia Medica

New Veterinary College.

T. C. Howatson	Pathology of the Horse	H. Kirby	Junior Anatomy
H. Whipp	Pathology of the Domesticated Animals other than the Horse	H. Taylor	Materia Medica
A. A. Walker	Senior Anatomy	A. Walker	Chemistry
A. A. Walker	Physiology	W. A. Elder	Botany
		H. Taylor	Hygiene
		W. L. Gascoyne	Pathology
		T. C. Howatson	Meat Inspection
		H. Kirby	Zoology

Glasgow Veterinary College.

Henry O. Oliver	Medicine, Surgery, and Obstetrics (written), Horse	W. Watson	Veterinary Hygiene and Dietetics
James Irvine Smith	Do. (written), Cattle	Jas. Irvine Smith	Parasitology
W. Watson	Materia Medica and Therapeutics	W. H. Edwards	Zoology
W. Watson	Pathology and Bacteriology	W. M. Ferguson	Junior Anatomy
		J. Allan	Senior Anatomy
		W. G. Forbes	Physiology
		W. Gray	Chemistry
		W. M. Ferguson	Botany

36 Large Silver Medals, £22, 19s.

VI.—AGRICULTURAL CLASS, EDINBURGH UNIVERSITY.

John O. Peet, Aughton, Ormskirk, Lancashire	£4	0	0
Alex. Grant, Raecletich, Glenrinnes, Dufftown	3	0	0
J. W. Eastham, Blackhurst, Lostock Hall, Preston	3	0	0
	£10	0	0

ABSTRACT OF PREMIUMS.

1. Professor Williams—Medium Gold Medal				£4	17	6
2. Kelso Show				2510	12	9
3. District Shows:—						
Stock	£288	17	3			
Special Grants	71	0	0			
Local Societies—43 Medals	27	8	3			
Ploughing Competitions—212 Medals	51	4	8			
				438	10	2
4. Cottages and Gardens—46 Minor Silver Medals				11	2	4
5. Veterinary Department—Medals to Students				22	19	0
6. Agricultural Class, Edinburgh University				10	0	0
				£2998	1	9

STATE OF THE FUNDS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

As at 30th NOVEMBER 1898.

I. HERITABLE BONDS—		
£11,000 at 3¼ per cent, £500 at 3½ per cent, £15,500 at 3¼ per cent, £7500 at 3 per cent		£34,500 0 0
II. DEBENTURE STOCKS—		
£4,250 North British Railway Company 3 per cent, at £108¼	£4,600 12 6	
£2,727 Caledonian Railway Company 4 per cent, at £145¼	3,960 19 4	
£1,334 London and North-Western Railway Company 3 per cent, at 113 . .	1,507 8 4	
		10,069 0 2
III. BANK STOCKS—		
£6,407 7 8 Royal Bank of Scotland, at £236	£15,121 8 5	
2,218 16 5 Bank of England, at £359 .	7,965 11 4	
2,500 0 0 British Linen Company Bank, at £500 . . .	12,500 0 0	
2,341 13 4 Bank of Scotland, at £340 .	7,961 13 4	
£13,467 17 5		43,548 13 1
IV. ESTIMATED VALUE of Building, No. 3 George IV. Bridge .		3,100 0 0
V. ESTIMATED VALUE of Furniture, Paintings, Books, &c. . .		1,000 0 0
VI. ARREARS OF MEMBERS' SUBSCRIPTIONS considered recoverable		91 6 0
VII. BALANCE DUE BY ROYAL BANK OF SCOTLAND ON ACCOUNTS CURRENT, at 30th November 1898		1,009 13 11
AMOUNT OF GENERAL FUNDS . .		£93,318 13 2
VIII. TWEEDDALE MEDAL FUND—		
Heritable Bond, at 3½ per cent		£500 0 0

JAS. H. GIBSON-CRAIG, *Treasurer.*
GEORGE R. GLENDINNING, *Member of Finance Committee.*
WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, *4th January* 1899.

ABSTRACT of the ACCOUNTS of the HIGHLAND and

CHARGE.

1. **Balance** due by Royal Bank of Scotland at 30th November 1897				£1,707 8 9
2. **Arrears** of Subscriptions outstanding at 30th Nov. 1897			£117 11 0	
Whereof due by Members who have compounded for life, and are thereby extinguished		£11 7 6		
Sums ordered to be written off		61 19 0		
			73 6 6	
				44 4 6
3. **Interests and Dividends**—				
(1) Interest on Heritable Bonds, less Income-tax			£1,076 12 6	
(2) Interest on Debenture Stocks, do.			267 7 6	
(3) Interest on Deposit Receipts			21 1 6	
			£1,365 1 6	
(4) Dividends on Bank Stocks—				
Royal Bank of Scotland	£6,407 7 8	£512 11 8		
Bank of England	2,218 16 5	221 17 6		
British Linen Co. Bank	2,500 0 0	450 0 0		
Bank of Scotland	2,341 13 4	281 0 0		
	£13,467 17 5		1,465 9 2	2,830 10 8
4. **Subscriptions**—				
Annual Subscriptions			£982 6 0	
Life Subscriptions			1,020 18 0	
				2.003 4 0
5. **Transactions**—Sales, £11, 16s. 6d.; Advertisements, £37, 13s. 3d.				49 9 9
6. **Sum** received from Government in aid of Expenses of Agricultural Experiments				100 0 0
7. **Receipt** in connection with Dumfries Show				1 0 0
8. **Receipts** from Kelso Show				5,809 17 4
9. **Income-Tax** for three years to 5th April 1897 returned by Government				253 7 2
Sum of Charge				£12,799 2 2

Edinburgh, 4*th January* 1899.

AGRICULTURAL SOCIETY of SCOTLAND for the Year 1897-98.

DISCHARGE.

1. **Establishment Expenses—**			
Salaries and Wages			£1,172 0 0
Feu-duty, £28 ; Taxes, £40, 9s.			68 9 0
Coals and Gas			20 12 10
Insurances			16 14 8
Repairs and Furnishings			30 9 10
			£1,308 6 4
2. **Fee** to Auditor of Accounts for 1896-97			50 0 0
3. **Practical** Engineer			55 0 0
4. **Education—**			
(1) Forestry—Vote to Chair in Edinburgh University		£50 0 0	
(2) Agriculture—Prizes to Agricultural Class in Edinburgh University, £10; Fees to Examiners, Travelling Expenses, Refreshments, &c., £52, 13s. = £62, 13s. : *Less*—Forfeited entry fees, £23		39 13 0	
			89 13 0
5. **Chemical Department—**			
(1) Salary to Chemist		£50 0 0	
(2) Chemists' Fees and Expenses—			
Fees for Analyses for Members	£139 5 0		
Analyses in connection with Experiment, and Reports	91 16 10		
		231 1 10	
			281 1 10
6. **Veterinary Department**—Principal Williams, £26, 5s.; Medals, £22, 19s.			49 4 0
7. **Botanical Department**—Fee to Botanist for year			25 0 0
8. **Dairy Department—**			
(1) Examinations—Examiners, £31, 10s.; Travelling Expenses, £6, 5s. 9d.; Hotel Bill, £25, 2s. 6d.; Advertising, 19s. 6d.; Assistants, £10, 12s.; Miscellaneous, £11, 10s. 7d. = £86, 0s. 4d. : *Less*—Fees forfeited, £2		£84 0 4	
(2) Expenses of Committee to London		18 15 6	
(3) Vote to Scottish Dairy Institute for 1898		60 0 0	
			[illegible] 10
9. **Transactions**			649 11 9
10. **Ordinary** Printing, £82, 11s. 7d.; Advertising, £10, 17s.; Stationery, &c., £59, 6s. 4d.; Postages, £65; Bank Charges, &c., £7, 14s. 4d.			225 9 3
11. **Grants** to Public Societies—Scottish Meteorological Society, £20; Society for Prevention of Cruelty to Animals, £5			25 0 0
12. **Vote** to Scottish Agricultural Benevolent Institution (making, along with £500 granted last year, £1000 in all)			500 0 0
13. **Miscellaneous Expenses**—Secretary, attending Meetings for Nominations of Directors, £21, 11s.; Do. attending Shows, &c., £29, 6s. 6d.; Preparing Evidence for Rating Commission, £24, 18s. 6d.; Expenses to London of Society's Witness on Petty Customs, £10, 10s.; Reporting Board Meetings, £21; Law Agents' Account, £8, 8s. 10d.; Luncheons to Directors, &c., £24, 8s. 2d.; Prof. W. O. Williams for Apparatus for Measuring Horses (Medium Gold Medal), £4, 17s. 6d.; Sundries, £2, 14s.			147 4 6
14. **Investments** made—£3,100; less realised, £1,600			1,500 0 0
15. **Glasgow Show**—Premiums, £170; Expenses, £1, 3s.			171 3 0
16. **Kelso Show**—Premiums, £2,325, 12s. 9d.; Expenses, as per p. 413, £3,652, 16s. 9d.; Do. since closing of Show Account, £1, 18s. 5d.			5,980 7 11
17. **Premiums** for District Competitions			418 2 2
18. **Premiums** for Cottages and Gardens			9 3 8
19. **Arrears** struck off as irrecoverable			50 19 0
20. **Arrears** outstanding at 30th November 1898			91 6 0
21. **Balance** due by Royal Bank of Scotland on Accounts Current at 30th November 1898			1,009 13 11
Sum of Discharge			£12,799 2 2

JAS. H. GIBSON-CRAIG, *Treasurer.*
GEORGE R. GLENDINNING, *Member of Finance Committee.*
WM. HOME COOK, C.A., *Auditor.*

VIEW OF RECEIPTS AND PAYMENTS
For the Year 1897-98.

RECEIPTS.

1.	ANNUAL SUBSCRIPTIONS AND ARREARS received		£884 5 6
2.	LIFE SUBSCRIPTIONS		1,020 18 0
			£1,905 3 6
3.	INTERESTS AND DIVIDENDS—		
	Interests	£1,365 1 6	
	Dividends	1,465 9 2	
			2,830 10 8
4.	TRANSACTIONS		49 9 9
5.	GOVERNMENT Grant in aid of Agricultural Experiments		100 0 0
6.	RECEIPT in connection with Dumfries Show		1 0 0
7.	RECEIPTS from Kelso Show		5,809 17 4
8.	INCOME-TAX for three years to 5th April 1897 returned		253 7 2
	SUM OF RECEIPTS		£10,949 8 5

PAYMENTS.

1.	ESTABLISHMENT EXPENSES—			
	Salaries and Wages		£1,172 0 0	
	Feu-duty, Taxes, Coals, Gas, Insurances, Repairs, and Furnishings		136 6 4	
			£1,308 6 4	
2.	FEE TO AUDITOR of Accounts for 1896-97		50 0 0	
3.	PRACTICAL ENGINEER		55 0 0	
4.	EDUCATION		89 13 0	
5.	CHEMICAL DEPARTMENT		281 1 10	
6.	VETERINARY DEPARTMENT		49 4 0	
7.	BOTANICAL DEPARTMENT		25 0 0	
8.	DAIRY DEPARTMENT		162 15 10	
9.	TRANSACTIONS		649 11 9	
10.	ORDINARY Printing, Advertising, Stationery, Postages, Bank Charges, &c.		225 9 3	
11.	GRANTS to Public Societies		25 0 0	
12.	VOTE to Scottish Agricultural Benevolent Institution		500 0 0	
13.	MISCELLANEOUS		147 4 6	
14.	PAYMENTS in connection with Glasgow Show		171 3 0	
15.	PAYMENTS in connection with Kelso Show		5,980 7 11	
	Premiums	£2,325 12 9		
	General Expenses	3,654 15 2		
16.	PREMIUMS for District Competitions		418 2 2	
17.	PREMIUMS for Cottages and Gardens		9 3 8	
	SUM OF PAYMENTS			10,147 3 3
	BALANCE OF RECEIPTS			£802 5 2

JAS. H. GIBSON-CRAIG, *Treasurer.*
GEORGE R. GLENDINNING, *Member of Finance Committee.*
WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, *4th January* 1899.

ABSTRACT of the ACCOUNTS of the ARGYLL NAVAL FUND for Year 1897-98.

CHARGE.

1. FUNDS as at 30th November 1897—		
£3,193, 6s. 8d. 3 per cent Debenture Stock of the North British Railway Company, purchased at		£2,650 0 0
£3,000 Funded Debt of the Clyde Navigation Trustees, purchased at		2,970 0 0
£405 Royal Bank of Scotland Stock, purchased at . .		893 14 6
		£6,513 14 6
BALANCE on Account Current with Royal Bank of Scotland .		303 9 5
		£6,817 3 11
2. INCOME—		
(1) Interest on Investments—		
On £3,193, 6s. 8d. 3 per cent Debenture Stock of the North British Railway Company, £95, 16s., tax £3, 3s. 10d. . . .	£92 12 2	
On £3,000 Funded Debt of the Clyde Navigation Trustees at 4 per cent, £120, tax £4	116 0 0	
On £405 Royal Bank of Scotland Stock .	32 8 0	
		241 0 2
SUM OF CHARGE . .		£7,058 4 1

DISCHARGE.

1. ALLOWANCE to the five following Recipients—			
Malcolm H. S. Macdonald (second year)			£40 0 0
Edward L. Grieve (fourth year)			40 0 0
Percy L. H. Noble (fourth year)			40 0 0
Colin Kenneth Maclean (fifth year)			40 0 0
Leslie Menzies (fifth year)			40 0 0
			£200 0 0
2. FUNDS as at 30th November 1898—			
£3,193, 6s. 8d. 3 per cent Debenture Stock of the North British Railway Company, purchased at		£2,650 0 0	
£3,000 Funded Debt of the Clyde Navigation Trustees, purchased at . . .		2,970 0 0	
£405 Royal Bank of Scotland Stock, purchased at		893 14 6	
		£6,513 14 6	
Balances in Royal Bank—			
On Deposit Receipt dated 3rd February 1898 . .	£100 0 0		
On Current Account . .	244 9 7		
		344 9 7	
			6,858 4 1
SUM OF DISCHARGE . .			£7,058 4 1

JAS. H. GIBSON-CRAIG, *Treasurer.*
GEORGE R. GLENDINNING, *Member of Finance Committee.*
WM. HOME COOK, C.A., *Auditor.*

EDINBURGH, *4th January* 1899.

ABSTRACT of the ACCOUNTS

CHARGE.

1. LOCAL SUBSCRIPTIONS—						
Voluntary Assessment, Berwickshire				£327	10	0
" " Roxburghshire				343	0	11
" " Peeblesshire				105	6	4
" " Selkirkshire				93	16	3
Contribution by Town of Kelso				300	0	0
" " Border Union Agricultural Society . .				200	0	0
" " Berwickshire Agricultural Society . .				10	0	0
				£1,379	13	6
2. AMOUNT COLLECTED DURING SHOW—						
Drawn at Gates	£1,680	9	0			
Drawn at Grand Stand	352	2	11			
Catalogues and Awards	159	4	9			
Lavatories and Cloak-Rooms	4	3	9			
				2,196	0	5
3. FORAGE SOLD				10	5	9
4. RENT OF STALLS				1,679	4	0
5. RENT OF REFRESHMENT BOOTHS				230	0	0
6. INCOME FROM TWEEDDALE MEDAL FUND				16	18	4
7. LOAN OF HORSE-SHOEING PLANT				5	0	0
8. ADVERTISING IN CATALOGUE AND PREMIUM LIST . . .				112	0	11
9. SPECIAL PRIZES CONTRIBUTED				174	0	0
10. INTEREST FROM ROYAL BANK				6	14	5
				£5,809	17	4
BALANCE OF EXPENDITURE . .				168	12	2
				£5,978	9	6

Note.—To the above balance of	£168	12	2
There has to be added the premiums undrawn at 30th November, amounting to	185	0	0
Making the probable Deficiency .	£353	12	2

EDINBURGH, *4th January* 1899.

of the KELSO SHOW, 1898.

DISCHARGE.

1.	SHOWYARD EXPENDITURE—						
	Fitting up Showyard				£2,358	7	0
	Rosettes				34	8	2
	Repairing Iron Sheep Pens				7	17	6
	Miscellaneous				11	17	0
					£2,412	9	8
2.	FORAGE				243	16	8
3.	POLICE				48	0	0
4.	TRAVELLING EXPENSES of Judges, Stewards, &c.				96	2	10
5.	HOTEL AND LUNCHEONS—						
	Hotel Bill for 29 Directors, 7 Stewards, 25 Judges, Auditor, Veterinary Inspector, Secretary, &c.	£194	7	7			
	Luncheons in Showyard for Judges, Directors, Attending Members, and Members of Committee, and Breakfasts for Stewards, Assistants, &c.	91	3	1			
					285	10	8
6.	MUSIC				48	0	0
7.	PRINTING				215	18	7
8.	ADVERTISING and Bill-posting				94	6	8
9.	HORSE-SHOEING COMPETITION				12	18	0
10.	HIGHLAND INDUSTRIES				7	2	3
11.	VETERINARY INSPECTION				10	0	0
12.	CONCERT for Attendants				2	12	6
13.	ASSISTANTS and Attendants				119	10	2
14.	POSTAGES				45	0	0
15.	MISCELLANEOUS				11	8	9
	AMOUNT OF GENERAL EXPENDITURE				£3,652	16	9
16.	PREMIUMS drawn at 30th November				2,325	12	9
					£5,978	9	6

JAS. H. GIBSON-CRAIG, *Treasurer.*
GEORGE R. GLENDINNING, *Member of Finance Committee.*
WM. HOME COOK, C.A., *Auditor.*

PROCEEDINGS AT BOARD MEETINGS.

MEETING OF DIRECTORS, 2ND FEBRUARY 1898.

Present.—President—The Earl of Haddington. *Vice-President* Mr George R. Glendinning, Hatton Mains. *Ordinary Directors*—Mr A. Hutcheson, Beechwood; Mr Jno. M. Martin of Auchendennan; Mr A. M. Gordon of Newton; Mr Wellwood Maxwell of Kirkennan; Mr John Wilson, Chapelhill; Mr C. Howatson of Glenbuck; Sir Ralph Anstruther of Balcaskie, Bart; Mr R. Paterson, Hill of Drip; Mr J. Marr, Cairnbrogie; Rev. John Gillespie, LL.D., Mouswald Manse; Mr John Cran, Kirkton; Mr C. H. Scott Plummer of Sunderland Hall; Mr Speir, Newton Farm; Mr D. Wilson, yr. of Carbeth; Mr M'Hutchen Dobbie, Campend; Mr R. Dudgeon of Cargen; Mr John Macpherson Grant, Kingussie; Mr W. Elliot, Hollybush; Mr Alex. Cross of Knockdon; Mr W. T. Malcolm, Dunmore Home Farm; Mr Wm. Duthie, Tarves; Mr John M'Caig, Challoch. *Extraordinary Directors*—Colonel Charles Hope of Cowdenknowes; Mr W. L. Dickson, Drummelzier Haugh; Mr Bertram, Addinston; Mr Constable, Traquair Estate Office; Mr W. J. Maxwell, yr. of Munches; Sir Robert Menzies of Menzies, Bart.; Mr William Ford, Fentonbarns; Mr R. Shirra Gibb, Boon. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Engineer*—Mr James D. Park. Rev. John Gillespie, LL.D., in the chair.

The Secretary reported apologies for the absence of the Hon. the Master of Polwarth; Sir Robert D. Moncreiffe of Moncreiffe, Bart.; Sir John Gilmour of Montrave, Bart.; Mr Scott Dudgeon, Longnewton; Mr Dun, East Kincaple; Mr W. S. Ferguson, Pictstonhill; Mr James Hope, East Barns; Mr Middleton, Clay of Allan; Provost Smith, Kelso; and Mr Cameron, Balnakyle.

MINUTES.

The minutes of the meeting of the Directors and of the General Meeting of 19th January were read and approved of.

KELSO SHOW.

Special Prizes.—Sir Robert Menzies said that at last meeting his proposal that the Society should give premiums for Blackface wool was set aside because it was restricted to one breed. He therefore begged now to offer premiums for Blackface wool on his own account—viz., £18, in prizes of £3, £2, and £1 for five fleeces of Blackface hogg (ewe or wether) wool; similar prizes for five fleeces of Blackface ewe wool; and similar prizes for five fleeces of Blackface wether wool other than hoggs—all the exhibits to be unwashed, and shorn from stock bred and reared on the exhibitor's farm.

Mr Hutcheson moved that Sir Robert's offer be accepted, and the motion was cordially agreed to.

Mr Charles Howatson asked who were to be the judges of the wool prizes which he had offered.

The Secretary intimated that Messrs Alexander Campbell and Alexander Willison had agreed to act as judges of the wool best adapted for manufacturing purposes, to be shown on the sheep's back.

Mr **Martin** moved that the judges of Blackface sheep judge the wool for Sir Robert's prizes.

This was agreed to.

Headquarters.—The **Secretary** reported that the headquarters of the Society would be the Cross Keys Hotel, Kelso, and that the caterers in the showyard would be—James Hay, Aberdeen; W. A. Wilson, Glasgow; J. Brodie, Edinburgh; Hunter & Glover, Edinburgh; and R. Mackenzie, Kelso.

ROYAL COMMISSION ON RATING.

Mr **Maxwell** submitted the report of the Committee on this subject. The Committee had met that morning and appointed Messrs John Speir, Newton; James Shields, Dolphinston, Tranent, as witnesses, to give evidence on behalf of the Society before the Commission. To strengthen the hands of the witnesses he moved the following resolution, which he hoped the Board would unanimously adopt—viz.: "The Directors of the Highland and Agricultural Society are of opinion that personal property and industries other than agriculture have not hitherto borne a fair share of local taxation, and that thereby an excessive burden has been placed upon the agricultural industry; they recognise that some relief has been given by the Agricultural Rates Relief Act, 1896, and they consider it desirable that that Act should be made permanent, and that some system should be introduced whereby a larger contribution should be made to local taxation by personal property and industries other than agriculture." With the view of securing the object aimed at in the foregoing resolution—viz., the more equitable distribution of the burden of local taxation—the Directors recommend as follows: (1) That the Agricultural Rates, Congested Districts, and Burgh Land Tax Relief (Scotland) Act, 1896, be made permanent. (2) That measures be taken to provide that industries other than agriculture—such as factories, railways, shops, trades, &c.—shall contribute a larger share of local rates than at present. (3) That residenters deriving their incomes from invested funds and professions be assessed for local burdens upon these incomes. These were, in general terms, the points to be brought out by their witnesses before the Commission. The Committee were of opinion that hitherto the share of local taxation borne by heritable and real property was adverse to the agricultural interest. In the case of the farmer it fell upon the raw material, whereas in other instances it merely fell upon the premises occupied. It was of special importance that this should be emphasised, in view of the fact that the present rating bill, which undoubtedly gave a measure of justice, expired within five years, and they desired their witnesses before the Commission to emphasise the importance of making arrangements for the continuance at least of the arrangements now in force.

Mr **John Wilson** seconded, and the resolution was unanimously agreed to.

SCOTTISH AGRICULTURAL BENEVOLENT INSTITUTION.

Sir **Ralph Anstruther**, Bart., moved—"That it be remitted to the Finance Committee to consider and report as to the propriety of giving an annual subscription to the funds of the Scottish Agricultural Benevolent Institution." He recognised that the Board had dealt in a very generous manner with the institution in respect of the donation they had given, but some of them felt that something more ought to be done.

Mr **Speir** seconded, saying it would be a good thing if the Society could see its way to give such an annual grant as their surplus funds would afford.

The motion was agreed to.

PURE CULTURES IN CHEESE-MAKING.

An application was read from the secretary of the Stewartry Dairy Association, asking a renewal of the grant of £50 in aid of the investigations into the use of pure cultures of bacteria in cheese-making.

Colonel **Dudgeon** supported the proposal, and moved that the donation be granted. He had read the proof of Mr Campbell's report on the work done during the past year, and he felt bound to acknowledge that the most valuable results had been obtained. Further investigation, however, was necessary alike to confirm, or, it might be, to modify, the conclusions at which Mr Campbell had arrived. Several points had cropped up which were fully worthy of more consideration. The results, he felt sure, would be of great advantage to a large proportion of agriculturists in Scotland.

Mr **Alex. Cross** thought that before they renewed this grant they ought to see Mr Campbell's report.

The **Chairman** said it could not be seen by all the members until the 'Transactions' were published, and that would not be for some little time.

Mr **Speir** asked who was to carry out those investigations now that Mr Campbell had left Scotland.

The **Secretary** said he understood that further investigations were to be carried out at the Harris Institute by Mr Campbell, and that the cost would probably be less than in the Stewartry. He noticed from the statement that had been put in that last year's experiments cost £153. Of that amount £30 had been devoted to the dairy school at Craigley, where the experiments were conducted. The Board of Agriculture bore one-third of the total expenditure, the Highland Society one-third, and the other third was subscribed locally. If the cost of the dairy school at Craigley was deducted, the proportion borne locally was very small.

Mr **Martin** moved that the report be remitted to a Committee, consisting of Messrs Cross, David Wilson, John Speir, John M'Caig, and Colonel Dudgeon, and that they report to the Directors what should be done.

This motion was seconded and adopted.

Science Committee.

A meeting of the Science Committee was held in the forenoon. The new regulations issued by the Board of Agriculture for the administration of the Fertilisers and Feeding Stuffs Act were laid on the table. The Committee were gratified to find that the suggestions of this Society had been adopted in various particulars. In regard to future procedure, the Committee resolved to recommend that the Directors carefully watch the working of the Act, reserving to themselves the right to take further action should that seem necessary. The Committee also revised the schedule of unit prices for manures.

Approved.

Petty Customs.

Mr **Andrew Hutcheson** introduced the subject of petty customs in burghs in Scotland. It was proposed by a number of local authorities to send a deputation to London to endeavour, if possible, to get the present arrangement under which petty customs were levied abolished. He had been at London recently, and his expenses on last occasion were to be paid by the Government. A man could not live very riotously on what he got from them. He thought this Society should take up the question and bear a part of the expenses of this deputation. It was proposed in the first instance to approach Lord Balfour of Burleigh, Secretary for Scotland.

The **Chairman** asked, Why not approach Lord Balfour in Edinburgh, where his office is?

The **Earl of Haddington** said that he entirely agreed with Mr Hutcheson's proposal that these petty customs ought to be, if possible, abolished, but he did not quite see the necessity for going to London at this stage. He thought they should first of all see Lord Balfour of Burleigh in Scotland.

Mr **Gordon** of Newton moved that they give Mr Hutcheson the opportunity he desired—to go to London and live riotously. In other words, he moved that they authorise Mr Hutcheson to appear for them.

Mr **Cran** seconded. He referred to the petty customs as most iniquitous. Everything going into Inverness, down to a hen in a creel, had to pay petty custom, whereas everything that went out of Inverness to the country went free.

Mr **Speir** supported this proposal, describing the state of matters prevailing in Rutherglen.

Agreed.

MEETING OF DIRECTORS, 2ND MARCH 1898.

Present.—Vice-Presidents—Mr W. S. Ferguson, Pictstonhill; Mr George R. Glendinning, Hatton Mains. *Ordinary Directors*—Mr Hope, East Barns; Mr Wellwood Maxwell of Kirkennan; Mr John Wilson, Chapelhill; Mr C. Howatson of Glenbuck; Sir Ralph Anstruther of Balcaskie, Bart.; Mr R. Paterson, Hill of Drip; Rev. John Gillespie, LL.D., Mouswald Manse; Mr Cran, Kirkton; Mr Scott Plummer of Sunderland Hall; Mr Speir, Newton Farm; Mr Dun, Easter Kincaple; Mr David Wilson, yr. of Carbeth; Mr J. M'Hutchen Dobbie, Campend; Mr R. F. Dudgeon of Cargen; Mr John Macpherson Grant, Kingussie; Mr Walter Elliot, Hollybush; Mr Alexander Cross of Knockdon; Mr W. T. Malcolm, Dunmore Home Farm; Captain Robert Dundas, yr. of Arniston; Mr Jonathan Middleton, Clay of Allan; the Hon. the Master of Polwarth, Humbie House. *Extraordinary Directors*

—Mr John Clay, Edinburgh; Mr John Bertram, Addinston; Mr George W. Constable, Traquair Estate Office; Mr R. Shirra Gibb, Boon; Sir Robert D. Moncreiffe of Moncreiffe, Bart. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Auditor*—Mr William Home Cook, C.A. *Engineer*—Mr James D. Park. Sir James H. Gibson-Craig of Riccarton, Bart., in the chair.

Apologies were reported for the absence of the Earl of Haddington; Sir Robert Menzies of Menzies, Bart.; Sir John Gilmour of Montrave, Bart.; Mr Scott Dudgeon, Longnewton; Mr Duthie, Tarves; Mr Gordon of Newton; Mr Hutcheson, Perth; Mr Lumsden of Balmedie; Mr M'Caig, Challoch; Mr M'Gibbon, Ardnacraig; Mr Martin of Auchendennan; Mr Maxwell, yr. of Munches; Mr Walker, Portlethen; Mr James Auldjo Jamieson, W.S.; Dr A. P. Aitken, Chemist.

Before proceeding to business the **CHAIRMAN** said he was sure they would all regret very much that Sir John Gilmour had not yet sufficiently recovered to resume his ordinary business.

KELSO SHOW.

It was remitted to the Stewards and the Secretary to arrange for the usual concert for the attendants at the Kelso Show.

THE EDINBURGH SHOW.—A VISIT FROM ROYALTY.

On behalf of the General Purposes Committee, the **CHAIRMAN** reported what had been done with the view of getting a visit from the Prince of Wales to the Edinburgh Show next year. At one time it looked as if they would not be able to prevail upon his Royal Highness to attend, but it occurred to them that if they could get the Prince to allow himself to be nominated as President for the year they would have a better chance of attaining their object. He accordingly wrote the Duke of Buccleuch, who at once made inquiries, and only the other day he had a letter from Sir Francis Knollys intimating that his Royal Highness had expressed *his pleasure* to become, if asked, President for 1898-99. The letter also went on to say that his Royal Highness would have pleasure in accepting the Duke of Buccleuch's invitation to stay at Dalkeith with the view of attending the Show. The Chairman then referred to the date of the Edinburgh Show, remarking that it had always been distinctly intimated that it was of no use attempting to get his Royal Highness to attend in the fourth week of July, and they would require to leave his Royal Highness to say which week would suit him best. The first week would be most inconvenient, as it entailed much extra strain on the staff. He was sure they were very much indebted to the Duke of Buccleuch for the work he had done during the last three weeks, and he would beg to move that a vote of thanks be recorded to his Grace, not only for his services in this matter, but for the interest he had always manifested in the Society. He was surprised to hear that the Duke of York had never been elected a member of the Society though he had been twice President, and it occurred to him that the best way to put the matter straight would be to get his Royal Highness's consent to be elected an honorary member of the Society. He would formally move that his Royal Highness be invited to be elected an honorary member.

This was carried by acclamation.

Dr **GILLESPIE** said that they must all cordially indorse what Sir James had said as to the valuable and unceasing efforts of the Duke of Buccleuch. He would also move a vote of thanks to Sir James Gibson-Craig, for they would not be doing justice to their own feelings if they did not express in a general way their great indebtedness to Sir James, who had been most unremitting and anxious to bring about this consummation.

The vote was most heartily accorded, and Sir James briefly returned thanks.

Local Fund.—The **SECRETARY** intimated that he had made the usual application to the County Councils in the Edinburgh district for contributions towards the Show by means of voluntary assessment. His proposal to apply also to the Town Council for their usual subscription was approved.

The **CHAIRMAN** said a very considerable sum could be obtained locally by canvassing, and he thought they might intrust it to the Local Committee to see what could be done apart from the assessment.

Agreed.

Site.—It was reported on behalf of the Special Committee intrusted with procuring a site that they were not yet in a position to recommend any particular site. The Committee recommended that the matter be remitted back to them with powers to complete arrangements.

Agreed.

DATE OF THE SOCIETY'S SHOWS.

Dr **GILLESPIE** drew attention to this question, and moved a resolution to the effect that they give formal expression to the suggestion that the fixing of the date of the Edinburgh Show be remitted with powers to the General Purposes Committee, and that thereafter the Society's Shows be held in the third week of July. No doubt this question had caused a great deal of interest amongst members of the Society. There were different views, of course, some members preferring the fourth week; but he thought that, taking a general view of the whole situation, the most general satisfaction would be secured by fixing the third week. It was a compromise, a medium date, and it was desirable that the date should be exactly fixed in future, so that people would know what the arrangements of the Society were. They tried an earlier date, but Sir James had pointed out its inconvenience. A further advantage of having the third week would be that it would enable them, should circumstances be favourable, to receive Royalty on any future occasion without altering their arrangements at all.

Sir **Robert Moncreiffe**, Bart., seconded.

Dr **Shirra Gibb** moved the previous question. He thought it would be a great mistake to definitely fix any week now, having just released themselves from the fourth week.

The **Master of Polwarth** seconded.

A short discussion followed, and the prevailing opinion seemed to favour Dr Gibb's proposal.

Dr **Gillespie**, with the consent of his seconder, withdrew his motion, and the matter dropped.

SCOTTISH BENEVOLENT INSTITUTION.

The following minute of Finance Committee of 5th March was read:—

"Having carefully considered the remit, the Committee recommend that instead of giving an annual subscription the Society increase its donation from £500 to £1000.

"The Committee desire to explain that in arriving at this decision they have been influenced by the following considerations:—

"The object of the Scottish Agricultural Benevolent Institution being to establish pensions which will be continued at least during the lives of the beneficiaries, and which it is hoped will become practically perpetual pensions, the Committee were reluctant to recommend that any portion of the contributions of this Society should take the form of an annual subscription, which might be liable to be discontinued at any time. Such a subscription would have to be specially voted every year, and looking to the great fluctuations which occur in the Society's revenue, the Committee think it undesirable that the present Board of Directors should impose upon a succeeding Board of Directors the necessity of having at some time or other to choose between such unpleasant alternatives as discontinuing the subscription or paying it out of the Society's funded money. For these reasons the Committee are of opinion that it is preferable alike for the Institution and the Society that any further support by this Society should take the form of an additional donation. The Committee are happy to be able to say that, although the Society has already given the substantial donation of £500, its funds are at the present time quite able to afford such an additional donation as is recommended.

"Another consideration has weighed with the Committee. There is a contention that it is contrary to the strict reading of the Society's charter to apply any portion of the Society's funds to purely benevolent objects such as this. The Committee feel sure that whatever may be the views of individual members as to that legal question, there will not come from a single member of the Society anything but an expression of gratification at the course which the Society has taken in commemorating the long and beneficent reign of our beloved Queen. This consideration again has influenced the Committee in recommending that the Society's further support to the Scottish Agricultural Benevolent Institution should take the form of an addition to the Society's original donation.

"The Committee make this recommendation in the feeling that this should be the final contribution from the Society, seeing that the £1000 now given will provide one perpetual pension."

The **Chairman** moved the adoption of this proposal, subject to the confirmation of the General Meeting in June.

Sir **Ralph Anstruther** seconded.

Dr **Gillespie** was of opinion that the pension which would be thus formed should be called the Highland and Agricultural Society Pension. He thought that, on its merits, the donation was entitled to such a name. He would like to see benevolent people adopting the course of founding a pension in connection with this Institution. The naming of pensions after donors would lead people to give more.

Mr **John Speir** seconded.

The report was approved.

PURE CULTURES IN CHEESE-MAKING.

The Special Committee appointed with reference to pure cultures in cheese-making in connection with the Stewartry of Kirkcudbright Dairy Association recommended, on the understanding that the local society expend not less than £50, that the Directors should give a grant of £35 in aid of the investigations, a report to be supplied for publication in the Society's 'Transactions.'

Mr **CROSS** of Knockdon moved the adoption of the report.

The **MASTER OF POLWARTH** thought that reducing the grant from £50 to £35 was cheese-paring rather than cheese-making.

Mr **JOHN SPEIR** said the Committee were agreed that £35 would meet all claims without cheese-paring.

Mr **DUDGEON** seconded the approval of the report, and remarked that, with reference to the conditions attached to the grant, the local society had already voted £50. In regard to the general question, though the local society had been at considerable trouble and expense in carrying out the investigations, the results were such as he considered would be of national importance, and certainly a benefit to the whole cheese-making industry.

The report was adopted.

REDUCED RAILWAY RATES.

A letter from the manager of the Great North of Scotland Railway regarding reduced rates for farm and garden produce, just introduced upon that line, was submitted.

STIRLING SHOW, 1900.

It was remitted to a Committee to confer with a Committee of the Stirlingshire Agricultural Society to make all arrangements in connection with the above.

RAILWAY RATES FOR SHOW STOCK.

A letter was read from secretary of the Ayrshire Agricultural Society with reference to the desirability of obtaining lower rates and better facilities for conveying show stock by railways. It was agreed that a conference of representatives of Scottish agricultural societies be held in the chambers of this Society to consider the subject. Agreed that the matter be fully investigated. The following were appointed to represent the Society at that conference: Sir Robert D. Moncreiffe, Dr Gillespie, Master of Polwarth, and Messrs Alexander Cross, W. S. Ferguson, and Duthie.

This was all the business.

MEETING OF DIRECTORS, 6TH APRIL 1898.

Present.—*Vice-President*—Mr W. S. Ferguson, Pictstonhill. *Ordinary Directors*—Mr D. M'Gibbon, Ardnacraig; Mr Andrew Hutcheson, Beechwood; Mr John M. Martin of Auchendennan; Mr John Wilson, Chapelhill; Mr C. Howatson of Glenbuck; Sir Ralph Anstruther of Balcaskie, Bart.; Mr Paterson, Hill of Drip; Captain Thomas Hope of Bridge Castle; Rev. John Gillespie, LL.D., Mouswald Manse; Mr Cran, Kirkton; Mr Scott Plummer of Sunderland Hall; Mr Speir, Newton Farm; Mr Dun, Easter Kincaple; Mr D. Wilson, yr. of Carbeth; Mr M'Hutchen Dobbie, Campend; Mr W. H. Lumsden of Balmedie; Mr R. F. Dudgeon of Cargen; Mr John Macpherson Grant, Kingussie; Mr W. Elliot, Hollybush; Mr Alexander Cross of Knockdon; Mr W. T. Malcolm, Dunmore Home Farm; Mr John M'Caig, Challoch; Mr Jonathan Middleton, Clay of Allan; the Hon. the Master of Polwarth, Humbie House. *Extraordinary Directors*—Mr John Clay, Edinburgh; Mr W. L. Dickson, Drummelzier Haugh; Mr John Bertram, Addinston; Mr G. W. Constable, Traquair Estate Office; Mr R. Shirra Gibb, Boon; Sir Robert Menzies of Menzies, Bart.; Mr Scott Dudgeon, Longnewton; Mr Cameron, Balnakyle; Mr Lockhart, Mains of Airies; Mr Ford, Fentonbarns; Sir Robert Moncreiffe of Moncreiffe, Bart. *Treasurer*- Sir James H. Gibson-Craig of Riccarton, Bart. *Hon. Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. Sir John Gilmour of Montrave, Bart., in the chair.

The **SECRETARY** reported apologies for the absence of the Earl of Haddington; Mr Duthie, Tarves; Mr Douglas Fletcher of Rosehaugh; Mr Gordon of Newton; Mr G. R. Glendinning, Hatton Mains; Mr Maxwell, yr. of Munches; Mr Sinclair Scott Burnside; Principal Williams.

Minutes of preceding meeting of Directors, held on 2nd March, were approved of.

KELSO SHOW.

It was arranged to have the same parades as at Glasgow, the terms of admission to be as at Glasgow and Perth. A concert for the attendants will be held in the members' pavilion as formerly, the arrangements being left in the hands of Mr W. S. Ferguson. It was remitted to the Stewards to fill up vacancies that may occur in the list of judges.

EDINBURGH SHOW, 1899.

A letter was read from Sir Francis Knollys intimating that H.R.H. the Prince of Wales would accept of the Presidency of the Society for the year 1898-99.

A letter was read from Sir Francis de Winton intimating that H.R.H. the Duke of York would accept of honorary membership in the Society.

A letter was read from the Duke of Buccleuch acknowledging the special vote of thanks passed to him at the last meeting of the Board.

STIRLING SHOW, 1900.

The **SECRETARY** submitted the minutes of a conference held on the same day between a Committee of members of the Stirling Agricultural Society and a Committee of this Board—Dr Gillespie presiding. In opening the proceedings Dr **GILLESPIE** pointed out that the National Agricultural Society of Scotland had all through its history given liberal support to local societies, and should receive cordial support from those when visiting their several districts. Since 1860 over £20,500 had been given by the Society in grants of this description, and the Stirling Society had benefited to the extent of £550 since 1881. From one-fourth to one-fifth of the Society's entire income from members' subscriptions was devoted to the support of district shows. Mr Paterson, who spoke on behalf of the Stirling members, stated that they had resolved to agree not to hold the district show in 1900; but they urged that the Stirling Agricultural Society should now share in the grants which local societies received from the Highland Society, and that the Show of 1900 should not be held earlier than the third week in July. Dr Gillespie, on behalf of the Highland Society, thanked the deputation for the intimation they had made, and expressed the opinion that the Directors would agree to the proposals.

In moving the adoption of this minute, Dr **GILLESPIE** again emphasised the liberal way in which the Society had distributed its money. An opinion was abroad that the Society hoarded money, and spent it all upon one big show. It was very important that members of the Board and others interested should let it be known that that was not the case.

The **CHAIRMAN**, on behalf of the Board, expressed general satisfaction with the issue of the conference.

Railway Accommodation.—A letter was read from the Town Clerk of Stirling asking the Society to co-operate with the Town Council in urging the railway companies to provide improved accommodation at Stirling, in view of the Highland Show there in 1900.

The **CHAIRMAN** said that it would be necessary to have a small Committee of the Board to join with the local parties in urging this necessary reform.

Sir **JAMES GIBSON-CRAIG** said he hoped that any Committee that would be appointed would also insist upon the necessity for having good loading-banks. Facilities for loading stock and embarking passengers at Stirling were notoriously inefficient.

Mr **SPEIR** urged that the Committee should be appointed at once.

Mr **DAVID WILSON** explained that one of the great difficulties at Stirling was that, the station being a joint one, the one railway company was disposed to shift the blame on to the other.

Mr **MACPHERSON GRANT** was of opinion that it would be very desirable to have others besides local men on the Committee.

Ultimately the following Committee was appointed—viz.: The Chairman (Convener), Sir James Gibson-Craig, Mr Macpherson Grant, Mr Alexander Cross, and Mr David Wilson.

RAILWAY RATES FOR SHOW STOCK.

The **SECRETARY** read the minute of a conference of representatives of agricultural societies and others held on the same day to consider the question of obtaining lower rates and better facilities for the conveying of stock to and from shows. It was agreed to ask the railway companies to receive a deputation from the agricultural societies on the subject, and a deputation was accordingly appointed.

PETTY CUSTOMS.

Mr **ANDREW HUTCHESON** reported that he had attended in London in connection with this matter. He had done his best to state the case, and they had been received, as he thought, in a most favourable way by Lord Balfour of Burleigh. The upshot was that the Committee present in London, and representing various authorities, had agreed to promote a private bill for the abolition of petty customs throughout Scotland, the chief object of which would be to secure that agricultural produce should be admitted free to all towns and cities in the country.

GOVERNMENT GRANT.

There was submitted a letter from the Board of Agriculture, with Government grant of £100 on account of the Society's agricultural experiments in the year to 31st March 1898.

OFFICE-BEARERS AND DIRECTORS.

The following Committee was appointed to nominate Directors to be submitted to the ensuing General Meeting: Sir John Gilmour (Convener), Mr Walter Elliot, Mr Scott Plummer, Mr M'Hutchen Dobbie, Sir James H. Gibson-Craig, Mr Hutcheson, Captain Dundas, Mr David Wilson, and Mr Macpherson Grant.

PORTRAIT OF PRINCE OF WALES (673).—AN AMUSING DISCUSSION.

The SECRETARY asked leave to make a statement with regard to a picture of this celebrated Clydesdale horse, which was on exhibition in the room. He understood it was the intention to present the picture to the Society. It had been placed there in order that it might be examined.

Mr JAMES LOCKHART said, as an admirer of the old Prince, he thought it would be a great mistake if that picture was hung in the Society's room. It would be a great deal better for them, if they wished a picture of the old horse, to give something decent and get a picture for themselves.

Mr LUMSDEN of Balmedie begged to propose that they should return that picture. It was far too precious for the Society to keep, and it would be much better just to send it back whence it came.

The CHAIRMAN said he did not quite understand what they had to do with the picture at present. It had not been presented to them, and he presumed it had been sent there in order that they might have the opinion of some of their number who thought they knew something about horses.

No action was taken in the matter.

MEETING OF DIRECTORS, 4TH MAY 1898.

Present.—Vice-President.—Mr George R. Glendinning, Hatton Mains. *Ordinary Directors*--Mr Hutcheson, Beechwood; Mr John M. Martin of Auchendennan; Mr James Hope, East Barns; Mr J. Douglas Fletcher of Rosehaugh; Mr John Wilson, Chapelhill; Mr C. Howatson of Glenbuck; Mr Robert Paterson, Hill of Drip; Rev. John Gillespie, LL.D., Mouswald Manse; Mr John Cran, Kirkton; Mr George Dun, Easter Kincaple; Mr David Wilson, yr. of Carbeth; Mr W. H. Lumsden of Balmedie; Mr Robert F. Dudgeon of Cargen; Mr John Macpherson Grant, Kingussie; Mr Walter Elliot, Hollybush; Captain Robert Dundas, yr. of Arniston; Mr William Duthie, Tarves; Mr Jonathan Middleton, Clay of Allan. *Extraordinary Directors*—Mr John Clay, Edinburgh; Mr John Bertram, Addinston; Mr G. W. Constable, Traquair Estate Office; Sir Robert Menzies of Menzies, Bart.; Mr C. M. Cameron, Balnakyle; Mr William Ford, Fentonbarns. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Honorary Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*- Dr A. P. Aitken. Sir John Gilmour of Montrave, Bart., in the chair.

The SECRETARY reported apologies for the absence of Sir George Houston Boswall of Blackadder, Bart.; Sir Robert Moncreiffe of Moncreiffe, Bart.; Mr Cross of Knockdon; Mr Ferguson, Pictstonhill; Mr Shirra Gibb, Boon; Captain Clayhills Henderson of Invergowrie, R.N.; Mr Malcolm, Dunmore Home Farm; Mr Scott Plummer of Sunderland Hall; Mr Speir, Newton.

The minutes of last meeting of Directors were held as read and approved of.

KELSO SHOW.

The following were appointed as attending members—viz.: *Shorthorns*—Mr Robert Paterson. *Aberdeen-Angus*—Mr C. M. Cameron. *Galloways*—Mr William Ford. *Highlanders*—Sir Robert Menzies. *Ayrshires*—Colonel Dudgeon. *Clydesdale Stallions*—Mr George Dun and Mr W. Duthie. *Clydesdale Mares and Fillies*—Mr J. M. Martin, Mr J. Macpherson Grant, and Mr J. M'Hutchen Dobbie. *Hunters*—Sir Ralph Anstruther and Mr Bertram. *Hackneys*—Mr D. Wilson and Mr C. J. Cunningham. *Roadsters and Ponies*—Mr G. W. Constable. *Shetlanders*—Provost Smith and Mr W. H. Lumsden. *Blackface Sheep*—Mr John Speir and Mr John Marr. *Cheviots*—Mr John Clay. *Border Leicesters*—Mr John Wilson. *Shropshires*—Mr J. Cran. *Half-Breds*—Mr R. Shirra Gibb. *Swine*—Mr J. Scott Dudgeon. *Poultry*—Mr Scott, Sinton. *Dairy Produce*—Mr C. Howatson. *Wool*—Mr Jno. M'Caig. *Horse-Shoeing*—Sir James Gibson-Craig, Mr J. M'Hutchen Dobbie, G. W. Constable, and Mr Shirra Gibb.

The SECRETARY intimated that Mr G. S. Douglas, town clerk, Kelso, had a list of the lodgings to let, and that intending visitors should apply to him. He also reported that Mr Alfred Mansell, Shrewsbury, had agreed to judge the Shropshires and Oxford Downs, and that Mr John Angus, Whitefield, Morpeth, had agreed to judge the swine.

EDINBURGH SHOW, 1899.

Minutes of Committee meetings in connection with the proposed site for this Show were laid on the table. The last was read, from which it appeared that arrangements had been made to hold the Show on the lands of Prestonfield, Newington, the property of Sir William Dick Cunyngham. This report was adopted.

SALE OF POISONS.

A letter was read from Mr Alexander Cross, M.P., asking the support of the Society to a movement for the abolition of provisions in the Pharmacy Act, 1868, which confine the sale of poisonous sheep-dips, poisons for killing insects, weeds, &c., and other poisonous articles, to chemists who are members of the Pharmaceutical Society. In the course of a long letter Mr Cross explained the present position. There are two classes in the Pharmaceutical Society—viz., members and associates—and their admission is regulated by two separate examinations. The poisons scheduled in the Pharmacy Act, 1868, are only allowed to be sold by members, and the Society is empowered to institute prosecutions against any others who may make sales. Of late they had been prosecuting very freely in order to vindicate their monopoly. As was generally understood, sheep-dips, Mr Cross said, were sold at an enormous profit, and because of the restriction on their sale and the sale of other poisonous material used in horticulture and, in an increasing degree, in agriculture, new kinds could not be introduced. In the opinion of Mr Cross, all such restrictions were incapable of defence, and should be prohibited. No special knowledge was required to sell sheep-dip. He had intended to bring in a private bill to give freedom to sell such things as these by others than chemists, but the Pharmaceutical Society had themselves brought in a bill to amend the present Act, and he regarded the opportunity as peculiarly favourable for trying to get the existing Act amended in the way they desired. The price of all these articles would be enormously increased if chemists were allowed to have the monopoly of their sale. Circumstances now were quite different from those existing in 1868, when the Pharmacy Act was passed, and the members of the Pharmaceutical Society should now be divested of the monopoly.

Sir ROBERT MENZIES did not think there was a monopoly at present, as he could buy the articles named by Mr Cross from any ironmonger.

Mr J. M. MARTIN sympathised with the object of the letter.

Dr GILLESPIE thought the matter was worthy of very serious consideration.

Sir JAMES GIBSON-CRAIG moved that the letter be referred to the Law Committee, who might give the Board their opinion on the matter. He was somewhat puzzled to understand how the sale of these things could be said to be confined to members of this particular society, seeing that he could buy most of them in a village shop.

Mr JOHN WILSON seconded.

Mr ANDREW HUTCHESON moved that they support Mr Cross right away. The tendency of the proposed legislation of the Pharmaceutical Society would be to make everything dearer, and he saw no need for referring the matter to the Law Committee.

Mr DAVID WILSON seconded Mr Hutcheson's proposal, as he thought that what Mr Cross proposed was in the right direction.

Mr DUTHIE suggested that in remitting the matter to the Law Committee the remit should be with powers. It was very important that whatever was done should be done at once.

Dr **Gillespie** supported the proposal of Mr Hutcheson.

Sir **James Gibson-Craig** did not believe that ironmongers had hitherto been breaking the law.

After some discussion it was resolved (1) that the Secretary inform Mr Cross that the Board of Directors sympathise with and support generally the objects he has in view; (2) that the Chairman and the Secretary be authorised, if they should think it desirable, to petition Parliament in support of the action taken by Mr Cross; and (3) that it be remitted to the Finance and Law Committee to consider and report to next meeting of the Board as to the existing state of the law regarding the sale of poisons, and of sheep-dips and other commodities containing poisonous ingredients.

Central Station of Agricultural Research.

A letter was read from the British Association for the Advancement of Science, asking the opinion of the Board of Directors as to the desirability of the creation by the Government of a Central Agricultural Institution for the purpose of undertaking agricultural research, and of acting as a centre of union for the various bodies conducting similar researches in this country.

Colonel **Dudgeon** was gratified that the British Association was interesting itself in agricultural research, but he was not able to say that the proposal contained in their letter was the best in the circumstances. He deprecated any interference with what had been already done by existing institutions, and believed more good would come if they were to impress upon Government the wisdom of giving further assistance to those institutions. The nature of agricultural operations was so varied that it was impossible for them to be dealt with in one institution, and he doubted very much whether country districts would support the proposal of the British Association. A good purpose would be served if the Government were to give every facility in collecting and distributing in popular form the information gleaned by existing institutions. The Government might give assistance in that direction. He moved that the letter lie on the table.

Sir **James Gibson-Craig** seconded, and the motion was unanimously agreed to.

Dairy Examinations.

The **Secretary** intimated that the Dairy Committee had met that day and advanced arrangements so far as they could do so for the forthcoming examination at the Dairy Institute on Tuesday, 4th October, and the three following days.

Adulteration of Dairy Produce.

Letters were read from the Central Chambers of Agriculture and other bodies as to the desirability of steps being taken to have more stringent and effective measures introduced to prevent the adulteration of British dairy produce.

Dr **Gillespie** moved that they give every support in the direction indicated by these letters. He was glad to see from the reports in the day's papers that Mr Chaplin had now shown a great deal more backbone in this matter than he had done before. The bill which he introduced last year was devoid of point, and if he might be permitted to say so, he thought Mr Chaplin had been a good deal educated in the interval. His utterances yesterday were much more satisfactory than they used to be. The degree and extent to which adulteration of food products was carried on in this country was appalling, and the system seems to have been reduced to a fine art. They should leave no stone unturned in supporting the views embodied in the letters on the table. He moved that they be remitted to the General Purposes Committee.

This was unanimously agreed to.

Agricultural Examinations.

The **Secretary** reported that in the recent examinations thirty-two candidates had offered themselves for the diploma and certificate of the Society. Eight diplomas had been awarded to new candidates and fifteen certificates. Seven candidates who had failed in one or two subjects last year came up again and passed, so that the number of diplomas issued was fifteen. Six candidates offered themselves in the forestry examination. One secured a first-class certificate, and three second-class certificates.

Mr **Andrew Hutcheson** asked who was responsible for the age limit in the matter of candidates for these examinations? Was the Board responsible for it?

The **Secretary** said the examinations were conducted by the Council of Education, which acted under a charter. On that Council there sat five members elected by the Board of the Society. The action of the Council might be reviewed at a General Meeting of the Society, but not by the Board of Directors.

Dr **Gillespie** said that while it was irregular to discuss the question there, he, as one of the five, was quite prepared to defend the age limit. He was not going to give mere boys a diploma, secured as the result of cramming, and allow them to go throughout the country as representing the educational requirements of the Society. Such candidates might know precious little of practical agriculture, and by-and-by, in the course of a year or two, would be equally ignorant of the theory as well.

The Annual General Meeting was fixed to be held on the 15th June, and the Chairman reminded the Directors of the importance of having as many new members as possible for election on that day.

MEETING OF DIRECTORS, 1st JUNE 1898.

Present. — *Vice-Presidents* — Mr Ferguson, Pictstonhill; Mr G. R. Glendinning, Hatton Mains. *Ordinary Directors*—Mr A. Hutcheson, Beechwood; Mr James Hope, East Barns; Mr A. M. Gordon of Newton; Mr John Wilson, Chapelhill; Sir Ralph Anstruther of Balcaskie, Bart.; Rev. John Gillespie, LL.D., Mouswald Manse; Mr John Cran, Kirkton; Mr C. H. Scott Plummer of Sunderland Hall; Mr George Dun, Easter Kincaple; Mr David Wilson, yr. of Carbeth; Mr John M'Hutchen Dobbie, Campend; Mr Walter Elliot, Hollybush; Mr Alexander Cross of Knockdon; Captain Clayhills Henderson of Invergowrie, R.N.; Mr W. T. Malcolm, Dunmore Home Farm; Mr John M'Caig, Challoch; Mr Jonathan Middleton, Clay of Allan. *Extraordinary Directors*—Mr R. Shirra Gibb, Boon; Sir Robert Menzies of Menzies, Bart.; Mr William Ford, Fentonbarns. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Honorary Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr Aitken. *Engineer*—Mr James D. Park. *Veterinary Surgeon*—Principal Williams. Sir John Gilmour of Montrave, Bart., in the chair.

The **Secretary** reported apologies for the absence of the Hon. the Master of Polwarth; Sir George Houston Boswall of Blackadder, Bart.; Mr Cameron, Balnakyle; Mr Scott Dudgeon, Longnewton; Mr Duthie, Tarves; Mr Macpherson Grant, yr. of Ballindalloch; Mr Lockhart, Mains of Airies; Mr Lumsden of Balmedie; Mr M'Gibbon, Ardnacraig; Mr Marr, Cairnbrogie; Mr Martin of Auchendennan; Mr Paterson, Hill of Drip; Mr Sinclair Scott, Burnside; Mr Speir, Newton Farm; Mr Walker, Portlethen; Mr William Home Cook, C.A.

Before entering upon the formal business the **Chairman** called attention to the death, since they last met, of Mr Andrew Allan, late of Munnoch, Dalry. He said all would remember Mr Allan's gentle, kindly nature. They would all miss Mr Allan at their Show, and he moved that a formal vote of condolence be sent his relatives. This was unanimously agreed to.

Kelso Show, 1898.

Local Fund.—The **Secretary** reported the receipt of the following sums raised by voluntary assessment in the district of the Show — viz.: County of Roxburgh, £343, 0s. 11d.; county of Selkirk, £93, 16s. 3d. He had acknowledged the receipt of these sums, with the best thanks of the Directors.

Railway Arrangements.—The Stewards had held a meeting that forenoon, and considered various points in connection with the railway arrangements for the Show, and especially in connection with the subject of the despatch of live stock from Kelso at the close of the Show. They learned that it would not be possible to despatch live stock westwards until the passenger trains had all left. The railway company were adding 2000 feet to the platform, but even with this great increase it would considerably facilitate the despatch of the stock if exhibitors would keep the stock in the showyard until they were able to walk direct from there into the trucks at the railway station. The Stewards were anxious that this should be impressed upon the exhibitors at the Show, as, although it might delay the exodus of the stock from the showyard, it would greatly facilitate their being loaded and despatched from the station.

It was agreed to issue tickets in batches of 100 each to employers of labour, admitting their servants to the Show on the last day at 6d. each. It had not been found possible to make arrangements for a joint-ticket affording transit by rail and admission to the showyard. On inquiry, it had been found that wherever this system had been in operation there had been confusion, and the Stewards did not see their way to adopt it in this case.

The Stewards had also under consideration the question of measuring the height of horses, and agreed that the horses would be measured naturally, no stretching to be allowed. An official would be specially told off to attend on the Society's veterinary officer, whose duty it would be to see that the measuring was properly done.

Hotel Accommodation.—The CHAIRMAN suggested that it would be well, in view of the limited hotel accommodation at Kelso, to associate the Stewards with the Secretary in allocating rooms for Directors.

The MASTER OF POLWARTH wrote saying that he would like to assure the Board that the people and the railway companies interested in Kelso were doing everything in their power to ensure the comfort and convenience of the public, and to promote the success of the Show in every way.

The CHAIRMAN said he could corroborate that statement. The inhabitants of Kelso and district were interesting themselves in the Show in a manner not surpassed in any district to which the Show had gone in the past, and he had no doubt their labours would be crowned with good results.

These reports were adopted.

EDINBURGH SHOW, 1899.

The SECRETARY reported that he had received a letter from the County Clerk of Haddington intimating that his County Council did not deem it expedient to levy a voluntary assessment in aid of the funds of this Show in 1899.

Dr GILLESPIE said there was no doubt County Councils knew their own business best, and it was not the part of the Directors of that Society to pass any judgment on their action. He hoped, however, that the members of the Society resident in East Lothian would, on their own individual responsibility, do their best to raise a sum near to that which would have been raised by voluntary assessment.

Mr JOHN WILSON, as an East-Lothian farmer, although not resident in the county, expressed his regret that the County Council had come to the decision at which they had arrived, as it seemed to him to form a very bad precedent. He was the more astonished at this decision seeing that more than the majority of the members of the County Council were members of the Highland and Agricultural Society. He understood their view was that the tenant-farmers, had they imposed the voluntary assessment, would really have been imposing an assessment on the landlords. In that they were mistaken, as Mr Wilson had reason to know that the tenant-farmers in Berwickshire took a share of this voluntary assessment upon themselves. No one was imposing the assessment, but an opportunity was merely afforded through the ordinary channel of collection for those who were willing to contribute to the expenses of the forthcoming Show to do so. He trusted, therefore, that the County Council would reconsider the decision at which they had arrived.

SALE OF POISONS.

The SECRETARY read the minute of the Finance and Law Committee, held the same day, at which the remit from last meeting of the Directors regarding the communication of Mr Alexander Cross, M.P., was considered. In accordance with the resolution of that Committee the following letter had been addressed in name of the Society to the members of Parliament for Scottish counties:—

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND,
3 GEORGE IV. BRIDGE, EDINBURGH, 11*th May* 1898.

Restrictions on the Sale of Poisons.

SIR,—The Directors of this Society have had under consideration a letter from Mr Alexander Cross, M P., urging the desirability of efforts being made in Parliament to obtain greater freedom than exists at present in the sale of poisonous articles used in agriculture and horticulture.

You are aware that the Pharmacy Act of 1868 restricts the sale of poisons and commodities containing poisonous ingredients to chemists who are members of the Pharmaceutical Society. Mr Cross contends that this restriction is unnecessary for the safety of the public, and that it imposes an unjust burden upon agriculture, horticulture, and other industries which employ poisonous articles, by maintaining their prices at a higher scale than would be the case with unrestricted sale.

Mr Cross has given notice that he will move the addition of the following clause to the Pharmacy Acts Amendment Bill now before Parliament: "That nothing in this Act, nor in the Act to regulate the sale of poisons, 31 and 32 Vict. c. 121, entitled the Pharmacy Act, 1868, shall apply to, or interfere with, the business of persons who are engaged in the sale, distribution, or manufacture of insecticides, destroyers of vermin, or disease germs in plants, of ant destroyers, of preparations for prevention of disease in potatoes, grain, or other field or garden crops, or for the preservation and protection of plants from disease in greenhouses or in the open air, or for other such or similar purposes or of sheep-dips, or wool-dressings, or other articles used for such purposes."

The Directors of this Society sympathise with, and support generally, the objects Mr Cross has in view, and desire me to express the hope that you may see your way to use your endeavours in Parliament to obtain such freedom in the sale of poisonous articles employed in agriculture and horticulture as may be consistent with due regard to the safety of the public.—I am, sir, your obedient servant,

JAMES MACDONALD, *Secretary.*

Sir ROBERT MENZIES had some doubt as to whether the Society was well advised in taking up this matter at all. He had never found any difficulty in getting what he wanted in the shape of sheep-dips and things of that sort from the village shopkeeper.

Sir JAMES GIBSON-CRAIG agreed with Sir Robert, as he could always get what he wanted in that line from the village ironmonger.

Mr ANDREW HUTCHESON thought the object of the remit to the Committee was that they might report to the Directors on the state of the law as it stood at present. It did not seem to him that the minute read by the Secretary afforded them that information. They wanted to know where they really stood at present.

The SECRETARY read the communications which had passed between him and the Society's solicitors. It appeared from this that two distinct decisions have been given in the English courts regarding the meaning of the Pharmacy Acts, the distinction being between the sale of poisons in appreciable and non-appreciable quantities. The result of this was to show that on the strict reading of the Acts it is illegal for the parties to whom Sir Robert Menzies and Sir James Gibson-Craig referred to sell these articles at present.

Mr DAVID WILSON said he had no doubt that the reason why the Pharmaceutical Society did not prosecute was simply that it would be an unpopular thing to do; and if they were permitted to obtain the additional powers which they sought in the bills referred to by Mr Cross, then there was every probability that they would not hesitate to prosecute those local dealers who at present supplied them with sheep-dips, &c. He thought the Board should agree to the proposal made by Mr Cross.

Sir JAMES GIBSON-CRAIG thought the solicitor's letter was, on one point, not quite satisfactory. There appeared to be two opposing decisions turning on what is an appreciable quantity and what is not. Every one who manufactured these dips said they were harmless. It seemed to him they were doing all they could do at the present stage in asking members of Parliament to support the agricultural interest so far as they could consistently with public safety.

REBATEMENT OF INCOME-TAX.

The SECRETARY reported that a claim made by him on behalf of the Society for exemption from income-tax, on the ground that the Society, being a "legal charity," and therefore not liable for income-tax, had been allowed by the Income-Tax Commissioners, and that the sum of £253, 7s. 2d. paid for income-tax for the three years preceding 4th April 1897 had been refunded to the Society. The amount paid this year would also be refunded, so that, altogether, they would get back £370, and be exempted from income-tax in future.

Mr HUTCHESON asked if the Society had been paying income-tax all along without any one knowing whether that was right or not.

Sir JAMES GIBSON-CRAIG explained how the matter arose at present. The assessor had sought to charge the Society income-tax on the profits shown in its accounts for the past three years. Mr Macdonald looked into the matter, and concluded that, according to their charter, no such charge was allowable, and he therefore resisted it. In the course of his investigations he also found that the assessor had done wrong in charging the Society income-tax on their investments, and it was the rebatement on these investments which had now been reported. The plain fact was, the assessor had overreached himself in attempting to impose an increased tax, and it had been found that he was not entitled to charge even what he had been charging.

Dr GILLESPIE said great credit was due to the Secretary for resisting the attempt by the assessor to get the Society to pay on profits upon which it was not entitled to pay, and also for having gone into the whole matter, so that they now knew that they had been paying income-tax which was quite illegal. He thought they ought to acknowledge the Secretary's efforts in this respect.

Mr MACDONALD briefly acknowledged what had been said.

SCIENCE COMMITTEE.

The SECRETARY read the minute of the Science Committee held on the same day. Arrangements had been made for the manurial experiments of the current year, and a payment of £35 had been authorised to Dr Aitken for various reports. A letter was read from a private firm in London asking the Society to join them in making experiments in the use of basic slag. The Committee could not recommend the Society to undertake any such series along with a private firm, but they contemplated a series of experiments of the same kind on their own account.

This report was adopted.

PUBLICATION COMMITTEE.

Payments amounting to £139, for articles in the forthcoming volume of the 'Transactions,' were authorised by this Committee. Last year a corresponding sum of £137 had been paid. It was remitted to the Convener and Secretary to arrange for papers for the next volume of the 'Transactions.'

This report was adopted.

COUNCIL ON EDUCATION.

In the absence of Mr John Speir, Mr HUTCHESON moved the following: "That the Secretary be asked to state how many meetings have been held by the Council on Education during the past three years, and how many attendances have been made by each member."

Captain HENDERSON seconded.

The SECRETARY asked whether the motion meant a return of the attendances of their own members who sat on the Council on Education as representing that Society, or a return of all the members of the Council on Education.

Mr M'CAIG said they could only furnish a return of the attendances of their own members.

The Secretary was instructed accordingly.

Dr GILLESPIE moved the suspension of the Standing Orders in order that he might propose a resolution, of which notice had not been given. Leave to suspend the standing orders was granted.

Dr GILLESPIE then moved, that it be remitted to the General Purposes Committee to take such steps as they might think desirable with the object of obtaining increased Government grants for agricultural education in Scotland. He said they were aware that a very large sum, amounting to something like £100,000, would shortly be available for educational purposes in Scotland, and it was very desirable that some portion of this, at least, should be devoted to agricultural education, all the more as agricultural research was not sufficiently attended to at the present time. He wished this Committee to see that whatever money was available should be ear-marked for the benefit of agriculture, and he therefore proposed to empower the General Purposes Committee to act as a Watching Committee, and take whatever steps might be necessary in the direction indicated.

Mr ANDREW HUTCHESON seconded, and the motion was unanimously agreed to.

MISCELLANEOUS.

The SECRETARY reported that the names of 114 new members had been given in for election on 15th June.

MEETING OF DIRECTORS, 15TH JUNE 1898.

Present.—President—The Earl of Haddington. *Vice-President*—Mr W. S. Ferguson, Pictstonhill. *Ordinary Directors*—Mr A. Hutcheson, Beechwood; Mr James Hope, East Barns; Mr John Wilson, Chapelhill; Mr Charles Howatson of Glenbuck; Captain Thomas Hope of Bridge Castle; Rev. John Gillespie, LL.D., Mouswald Manse; Mr Speir, Newton Farm; Captain Clayhills Henderson of Invergowrie, R.N. *Extraordinary Directors*—Mr John Clay, Edinburgh; Mr John Bertram, Addinston; Sir Robert Menzies of Menzies, Bart. *Teasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Auditor*—Mr William Home Cook, C.A. *Veterinary Surgeon*—Principal Williams. The Right Hon. the Earl of Haddington in the chair.

The **Secretary** reported apologies for the absence of Sir Robert Moncreiffe of Moncreiffe, Bart.; Sir John Gilmour of Montrave, Bart.; Mr Cross of Knockdon; Mr Duthie, Tarves; Mr Elliot, Hollybush; Mr Glendinning, Hatton Mains; Mr Macpherson Grant, yr. of Ballindalloch; Mr M'Gibbon, Ardnacraig; Mr Malcolm, Dunmore; Mr Martin of Auchendennan; Mr Paterson, Hill of Drip; Provost Smith, Kelso; Mr James Auldjo Jamieson; and Mr Sinclair Scott, Burnside.

Kelso Show.

A letter was read from Mr John Robson inquiring whether a ewe, which was one of a first-prize pen of three ewes at a former Show, is eligible to compete at Kelso in the ewe class, seeing that the class is now confined to single animals. The rule of the Society is that an animal which has won the first prize cannot again compete in the same class, but must be shown as extra stock.

Mr W. S. **Ferguson** said the nature of the competition was entirely changed. A group competition was not the same as a single-animal competition, and he thought that a single ewe in a group competition before should be allowed to compete in the single class now.

The **Secretary** explained that in connection with horses a precedent had been established whereby an animal which had won in a certain height before could not compete again in a class with a different height.

Mr **Ferguson** thought the cases were not parallel.

The Rev. Dr **Gillespie** did not agree with Mr Ferguson. He thought it would be straining the rule to admit one of these animals again. He therefore moved that the rule as it stands be enforced.

Sir **Robert Menzies** seconded this motion, saying he was quite sure that any man who intended to show a single ewe would take care to pick out the best of the three which won the group before. The ewe in this case ought clearly to be excluded.

Mr **Ferguson** moved that a single animal in a previous first-prize group should not be excluded.

Mr **Howatson** seconded, on the ground that it was very desirable to have as large a number as possible competing.

On a vote being taken, four voted with Mr Ferguson and six with Dr Gillespie.

It was therefore agreed that the single ewe in a first-prize group of a former year should not be allowed to compete this year.

Agricultural Education.

Dr **Gillespie** moved that a Committee be appointed to consider and report on the rules and regulations relating to the Society's examinations in agriculture. In speaking to his motion, the Doctor said that no words of his were necessary to commend the adoption of this motion. It was known to all of them that discussions had taken place in regard to these rules and regulations, and that they were not regarded as perfect. It was very desirable that all who secured the diploma of this Society should have a thorough knowledge of both the science and practice of agriculture. The time had come, in his opinion, when the whole situation should be reviewed and an attempt made to find out the best that could be devised for the end in view.

Mr **John Speir** seconded, and the motion was unanimously agreed to, the Committee being appointed as follows: Dr Gillespie (Convener), Messrs Andrew Hutcheson, David Wilson, jun., John Speir, George R. Glendinning, and Sir James Gibson-Craig.

Some discussion took place as to whether the professors of Glasgow and Edinburgh should be put upon the Committee, but it was deemed advisable to confine the Committee to members of the Board, with power to call in whatever advice and assistance they might find necessary.

MEETING OF DIRECTORS, 2nd NOVEMBER 1898.

Present.—Ordinary Directors—Mr Howatson of Glenbuck; Mr Paterson, Hill of Drip; Rev. John Gillespie, LL.D.; Mr John Cran, Kirkton; Mr C. H. Scott Plummer of Sunderland Hall; Mr John Speir, Newton Farm; Mr George Dun, Easter Kincaple; Mr David Wilson of Carbeth; Mr M'Hutchen Dobbie, Campend; Mr W. H. Lumsden of Balmedie; Mr R. F. Dudgeon of Cargen; Mr John Macpherson Grant, Kingussie; Mr Walter Elliot, Hollybush; Mr Alexander Cross of Knockdon; Captain Clayhills Henderson of Invergowrie, R.N.; Mr W. T. Malcolm, Dunmore Home Farm; Mr John M'Caig, Challoch; Mr Jonathan Middleton, Clay of Allan;

Mr E. Hedley Smith, B.L., Whittinghame; Mr William Clark, Netherlea; Mr W. S. Ferguson, Pictstonhill; Mr R. Shirra Gibb, Boon; Mr R. W. B. Jardine, yr. of Castlemilk; Mr Alexander M. Gordon of Newton. *Extraordinary Directors*—Right Hon. Lord Provost Mitchell Thomson; Bailie Thomas Sloan; Mr James Hope, East Barns; Mr George R. Glendinning, Hatton Mains; Mr Gavin Jack, Swanston; Sir Robert Menzies of Menzies, Bart.; Mr Scott Dudgeon, Longnewton; Mr William Ford, Fentonbarns; Sir Robert D. Moncreiffe of Moncreiffe, Bart.; Mr John M. Martin, Edinburgh; Mr Andrew Hutcheson, Beechwood; Mr John Wilson, Chapelhill. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Hon. Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A.

On the motion of Dr GILLESPIE, Sir James Gibson-Craig, Bart., occupied the chair at the opening of the meeting.

The SECRETARY reported apologies for the absence of the Marquis of Lothian, K.T.; the Earl of Rosebery, K.G.; the Earl of Hopetoun; Sir Thomas D. Gibson-Carmichael of Skirling, Bart.; Sir Archibald Buchan Hepburn of Smeaton, Bart.; Right Hon. Arthur James Balfour of Whittinghame, M.P.; Mr Cameron, Balnakyle; Mr Duthie, Tarves; Mr Lockhart, Mains of Airies; Mr Stirling of Keir; Captain R. Dundas, yr. of Arniston.

MINUTES.

Minutes of meeting of Directors held on the 15th June, of General Meeting held same day, of meeting of deputation of Directors held on 6th July, and of meeting of Members held on 6th July, having been printed, were held as read and approved of.

ELECTION OF CHAIRMAN.

Mr A. M. GORDON of Newton rose to move the election of a chairman for the ensuing year. He had pleasure in nominating Sir John Gilmour, Bart. of Montrave, for this honourable office. Than Sir John no gentleman was better fitted to occupy the position on such an auspicious occasion as they had in view during the ensuing twelve months.

Mr W. S. FERGUSON seconded, and the motion was unanimously agreed to.

Sir JAMES GIBSON-CRAIG, addressing Sir John, said he had very great pleasure in intimating his unanimous election as Chairman, and in vacating the chair in his favour.

Sir JOHN GILMOUR took the chair amidst cheers. He could only say that this most kind proposition of theirs was one concerning which, from personal reasons, he had some doubt; but in view of the unanimity expressed in the desire which had now been conveyed to him by Sir James, and in view of the great consideration shown to him during the past twelve months, he felt very proud indeed of the position in which they had now placed him, and he thanked them from his very heart. He looked upon the year to come as likely to be very marked in the history of their national Society, and he felt that, no matter how eager he might be in the interests of the Society, he would be run neck-and-neck by every member of the Board to bring things to a successful conclusion.

DECEASED MEMBERS.

The CHAIRMAN said it was with deep feelings of regret that they learned during the vacation of the death of a nobleman who long had taken an active interest in, and had done much for, the progress of agriculture. He referred to the Earl of Mansfield, who was the father of that Society, having joined in the year 1833. He moved that a special expression of regret at his death should be placed in their minutes, and an excerpt therefrom sent to the present Lord Mansfield and other members of the family. Agreed.

The CHAIRMAN further desired to direct attention to the serious loss the Society had sustained during the vacation by the death of their engineer, Mr James Dove Park. They all knew how hearty he was in the work of the Society, and the deep interest which he took in its progress, and the active services which he was always willing to give. They had a very deep regard for Mr Park on that Board, and a high appreciation of his services to the Society during the twenty-five years in which he occupied the position of engineer. He moved that they engross an expression of their regret at his death in their minutes, and send an excerpt to Mrs Park. Agreed.

STANDING COMMITTEES.

The SECRETARY intimated that the Standing Committees for the year had been adjusted by the Board in committee that morning, and on the motion of the Chairman it was unanimously agreed to accept the findings then arrived at.

VISIT OF THE PRINCE OF WALES.

The SECRETARY read a letter from Sir Francis Knollys, dated 18th June, conveying the thanks of his Royal Highness for his election as President for the ensuing year.

KELSO SHOW.

Accounts.—The SECRETARY read a statement showing that the loss on the Kelso Show had been £353, 12s. 2d.

The CHAIRMAN thought that this was a result upon which they had every reason to congratulate themselves. At the Show held in 1889 at Melrose they had lost £728, and at the previous Show at Kelso in 1880 their loss had been £1456. They had, therefore, every reason to be gratified with the result this year.

Transference of Members' Tickets.—The CHAIRMAN reported that at the meeting in committee they had a case before them of the transference of a member's ticket to one who was not a member. The Board felt satisfied that this was done through a mistake, and that no further notice should be taken of the matter. Agreed.

Horse-Shoeing Competition.—The CHAIRMAN stated that he had been asked at Kelso to authorise the giving of a special prize of £2, offered by Sir James Gibson-Craig, for the competitor who showed the greatest expediency, combined with good workmanship, in this competition on the Thursday. He had taken the responsibility upon himself of accepting the generous offer, and he now asked the Board to indorse his action. Agreed.

EDINBURGH SHOW, 1899.

Local Fund.—The SECRETARY read a letter from the County Clerk of Mid-Lothian intimating that the County Council had resolved to impose a voluntary assessment of ¼d. in the £1 on owners of lands and heritages in aid of the local fund. This should raise a sum of about £700.

The SECRETARY was instructed to convey the thanks of the Directors to the County Council for their action in the matter.

Mr JAMES HOPE said that in view of the Mid-Lothian County Council's action he thought it might be worth while to again approach the County Council of East Lothian and ask them to consider their decision not to impose this voluntary assessment. Some of them who, like himself, were members of that County Council might be able to do something to get the County Council to reconsider the matter.

The CHAIRMAN said it was very desirable that they should not lose any opportunity of securing help for this great enterprise, and he thought they might leave it to Sir James Gibson-Craig, himself, and the Secretary to find the best way of carrying the suggestion of Mr Hope into effect.

Prize-List.—The SECRETARY stated that the Shows Committee had met on Tuesday and revised the prize-list. The usual practice with this report has been to have it printed and circulated for consideration at next meeting of the Board. On the motion of the Chairman this course was agreed to. One point, the Chairman said, the Committee desired to submit to the Board that day. With the view of commemorating the Presidency of the Prince of Wales and his visit to the Show, the Committee recommended the Board to offer a gold medal for the best animal or pen in each of the sections for cattle, horses, or sheep, and for the best pen of swine. Their idea was to prepare a gold medal, value £10, of the same size as the ordinary medal of the Society, and to call it the Prince of Wales gold medal. They had, however, to approach his Royal Highness on the subject, and all they wanted was the general approval of the idea by the Board. Agreed.

Special Prizes.—The following special prizes were announced: (1) Sir John Gilmour of Montrave, Bart., £25 in prizes for yearlings by thoroughbred stallions, as at Kelso; (2) Hunters' Improvement Society, gold medal, value £10, 10s., for best Hunter filly foaled in the year 1896, 1897, or 1898; (3) Polled Cattle Society, gold medal for best animal of the Aberdeen-Angus breed in the breeding sections; (4) Galloway Cattle Society, two champion prizes, value £10, 10s. each, for the best male and best female respectively in the Galloway classes; (5) Clydesdale Horse Society, Cawdor Cup for mares.

Sir ROBERT MENZIES intimated that he would offer, as at Kelso, special prizes for Blackface wool.

The thanks of the Board were voted to the donors of these prizes.

Edinburgh Agricultural Association.—A letter was read from the Secretary of the Edinburgh Agricultural Association intimating that the Directors of the Edinburgh Agricultural Association had unanimously resolved to recommend to the members that the Association do not hold a Show next year in view of the Highland Show being held in Edinburgh; and that his Directors desired him to submit the following suggestions—viz.: (1) That there be Derby classes for yearling Clydesdale colts and fillies—sweepstakes £1 each; (2) that a butter-making competition be held in the Show; and (3) that classes for Jersey cattle be included in the prize-list.

It was mentioned that these suggestions were dealt with in the report of the Shows Committee. In the meantime the Directors expressed gratification at the decision of the Edinburgh Association not to hold their Show during the coming year.

Dubbing Poultry.—A letter from the British Anti-Dubbing Association, urging that poultry which have been "dubbed" should be disqualified at the forthcoming Show, was deferred till next meeting also.

Royal Pavilion.—After some discussion a small Committee was appointed to arrange for the erection of a Royal pavilion in the showyard, and to consider and report as to committee-room and members' pavilion.

A Committee was appointed to consider and report on the tenders.

Forage.—The **Secretary** was authorised to advertise for tenders for supply of forage.

Hotel Accommodation.—A Committee was appointed to consider and report as to hotel accommodation and caterers in the showyard.

Trial of Manure-Distributors.—The **Secretary** read a letter from Mr G. Wallace, Terregleston, Dumfries, suggesting that the Society should hold a trial of machines for distributing artificial manures.

The **Chairman** stated that the Show Committee had on the previous day resolved that, looking to the very excellent trial which had taken place this year at Dumfries, and the number of attractions which the Edinburgh showyard might otherwise contain, it might be wise to postpone consideration of this proposal for this season at any rate.

Mr **Scott Dudgeon** was not inclined to agree to this recommendation, as it seemed like shelving the matter. The Society had not shown the interest in implements recently it ought to have done. They ought to recognise the implement-yard every year in some way. He did not say that the recognition should take the form of a trial of manure-distributors, but there ought to be some recognition of the exhibits of implements by way of trial. There was no reason why such trials should take place during the Show. They might be held subsequently or previous to the Show, as the case might be.

Dr **Gillespie** said that, as one concerned with the arrangements at Dumfries, he had to say that these trials created a great amount of interest, and the matter was one second to none in importance. He moved that they appoint a special Committee to consider and report on the whole matter, and the practicability of doing something in this line some time during the year. Farmers had found great difficulty in deciding on the best kind of machine, and it was the duty of a Society like theirs to try to guide them in making a choice.

Mr **Speir** seconded the motion. Farmers were depending more and more on labour-saving machinery for profit on their farms, and yet, as a Society, they were giving the machinery department less and less attention. It was the duty of the Society to move as the public were moving, and to put within their reach the means of finding out the best machine.

Mr W. S. **Ferguson** did not at all admit that the Society had not been giving due attention to the implement department. They had given it all the attention it needed. They had had trials of manure-distributors at Aberdeen, which could not be regarded as very satisfactory. He did not see any good in remitting a matter of the kind to a Committee. There was no good purpose to be served by making the remit.

Mr **Jonathan Middleton** supported what Mr Speir had said. He thought that the Society was giving next to no attention to the implement-makers. They had done little or nothing for them in this way, and had never given recognition of a kind worthy of that Society to the agricultural engineers. To a very large extent farmers were in the hands of implement-makers in regard to the future success of their farming enterprise. They were depending more and more on the efficiency of their machinery. They ought, as a Society, to pay far more attention to the implement-makers, because they deserved it.

Sir **James Gibson-Craig** said if they were to have a trial it would be better to have it in the showyard, and his idea was that the Edinburgh yard would be so crowded that it would be better to postpone anything of the kind until the Stirling Show in 1900.

Mr **M'Hutchen Dobbie** supported Mr Scott Dudgeon's views. It was not a new question here. He suggested it when he first entered the Board, but they got quit of his difficulties by putting him on to the Show Committee—he supposed as a way of silencing him.

After some further conversation the **Chairman** said it seemed that the general desire was to have a Committee appointed to deal with the general question of trials of machinery. The only thing undecided seemed to him to be whether that Committee was to consider the trials of a special implement or the general question. He really thought that if there was to be a Committee appointed it ought to be a wider remit than had been suggested by Dr Gillespie.

It was ultimately resolved to remit to the following Committee to consider and report as to the means by which the Society can best encourage the introduction of labour-saving machines—viz.: Messrs Jonathan Middleton, G. R. Glendinning (Convener), Dr Gillespie, Mr John M'Hutchen Dobbie, Mr Scott Dudgeon, Mr John Speir, Mr W. S. Ferguson, Mr David Wilson, Mr John Wilson, Mr Hope, and the Chairman.

RAILWAY RATES FOR SHOW STOCK.

The **SECRETARY** read the following letter, which, by the instruction of the Board some months ago, he had addressed to the managers of the various Scottish railway companies:—

Railway Rates and Arrangements for Show Stock.

SIR,—The question of railway rates and arrangements for the conveyance of live stock to and from agricultural shows has lately been pressed upon the attention of Scotch agricultural societies by breeders and exhibitors, amongst whom there is a strong feeling of dissatisfaction with these railway facilities as they now exist. For the discussion of the subject a largely attended conference of representatives of leading Scotch agricultural societies was lately held at this office. The chief points as to which complaint was made are as follows:—

(1) *High Rates for Cattle in Horse-Boxes.*—The facilities for conveying horses in horse-boxes by passenger train were considered fairly satisfactory. Great exception, however, was taken to the high rate charged for conveying cattle in horse-boxes by passenger train — 50 per cent more than the rate for horses. Exhibitors complain strongly of this anomaly. They would usually wish to send their cattle as well as their horses to shows by passenger train, so as to avoid the long delays incurred by goods trains, but they are often deterred from doing so by the exorbitant rate for cattle. It was stated at the conference that railway companies have an aversion to the carrying of cattle in horse-boxes, and with this in view it was considered that the best remedy would be the introduction by the Scotch railway companies of special cattle-waggons for the accommodation of cattle, sheep, and pigs, and so constructed and fitted that they would be run with passenger trains. It was suggested that a waggon constructed on the lines of the present cattle-truck, with tarpaulin covering, with partitions to prevent jolting, and with breaks and fittings for attachment to passenger trains, would be satisfactory to exhibitors. It was pointed out that if such a waggon were in existence, with rates for it somewhat lower than the rates for horses in horse-boxes, it would undoubtedly be largely used, not only for the conveyance of show stock, but also for carrying valuable pure-bred stock, and for the transit of ordinary cattle when a speedy journey is desired.

(2) *Cattle in Goods Trains.*—Complaints were made of unreasonable delays in the transit of show stock by goods trains, and it was agreed that the railway companies should be urged to give better attention to the expeditious running of these trains in which valuable show stock are conveyed.

(3) *Rates for Dogs and Poultry.*—It was pointed out that while unsold cattle, horses, sheep, pigs, and implements are carried back from shows at half rates, no reduction is made on the return rate for dogs and poultry. The hope was strongly expressed that the railway companies may see their way to place dogs and poultry on the same footing as the other classes of show stock.

I was instructed to submit these points to the managers of the Scotch railway companies, and to express the hope that the companies may see their way to meet the wishes of exhibitors in the matters referred to.

I am further desired to say that the representatives of the Scotch agricultural societies would be gratified if they could have a conference on the subject with the managers of the Scotch railway companies, either in Edinburgh or Glasgow, at any time convenient to the managers.

I am writing in the same terms to the managers of the other Scotch railway companies.—I am, sir, your obedient servant, JAMES MACDONALD.

The railway companies had forwarded a reply, which was in the following terms:—

CALEDONIAN, GLASGOW AND SOUTH-WESTERN,
HIGHLAND, GREAT NORTH OF SCOTLAND,
AND NORTH BRITISH RAILWAY COMPANIES.

JAMES MACDONALD, Esq.,
3 George IV. Bridge, Edinburgh.

July 1898.

Railway Rates and Arrangements for Show Stock.

DEAR SIR,—We have now carefully considered the representations contained in your letter of the 1st ult., and beg to reply as follows:—

(1) *High Rates for Cattle in Horse-Boxes.*—The following is a note of the arrangements which the companies propose to put in operation on 1st prox., from which it will be observed that certain modifications have been made on the present charges—viz.: Bulls, cows, or oxen by passenger train in horse-box—If one stall occupied, 25 per cent beyond ordinary charge for one horse; minimum charge, 10s. If two stalls occupied, 25 per cent beyond ordinary charge for two horses; minimum charge, 15s. If three stalls occupied, 25 per cent beyond ordinary charge for three horses; minimum charge, 20s. If exclusive use of box is ordered for one animal, the charge to be as for two horses at ordinary rate. If exclusive use of box is ordered for two animals, the charge to be as for three horses at ordinary rate. If unsold, half rates to be charged on return journey. We regret we do not see our way to adopt your suggestion that special cattle-waggons should be constructed for conveyance by passenger train.

(2) *Cattle in Goods Train.*—Every effort will be made in the future, as in the past, to ensure the expeditious transit of show cattle forwarded by goods train.

(3) *Rates for Dogs and Poultry.*—The rates for dogs and poultry are at present very low, and we are sorry we do not see our way to agree to the adoption of half rates for their conveyance as in the case of horses, &c.

Mr Gordon asked if the companies declined to furnish them with special vans for the conveyance of cattle?

The Secretary—That is so.

Mr W. S. Ferguson—What do the reductions amount to?

The Secretary—They are very trifling indeed.

Mr Gordon moved that the Secretary be again instructed to address the Scottish railway companies to urge them to provide special vans for the conveyance of cattle. It seemed to him altogether absurd that these vans could be got in England and not in Scotland.

Mr Macpherson Grant seconded the motion, which was unanimously agreed to.

Petty Customs.

Mr Andrew Hutcheson moved—"That the Directors of this Society petition in favour of the Bill for the Abolition of Petty Customs in Scotland." This was a measure designed entirely for the good of agriculture, and he would like the Society to do all in its power to support the movement in its favour.

Mr Gordon seconded the motion, which was unanimously agreed to.

Scottish Agricultural Benevolent Institution.

A letter was read from the Secretary of this Institution acknowledging receipt of the Society's donation of £500 to the funds. In his letter Mr Connell said that he would bring before the Directors of the Institution the suggestion of the Board that one of the pensions should be called the "Highland and Agricultural Society Pension."

Association of Show Societies.

A letter was read from Mr Vero Shaw asking the Society to co-operate in a movement for the institution of an association, consisting of the officials of all the shows, for the discussion of general matters relating to shows.

Mr Macdonald said it was proposed to hold a conference of such officials during the Smithfield week.

It was remitted to the Chairman and the Secretary to decide as to whether or not this Society should be represented at that conference.

Formal reports were submitted regarding the recent dairy examinations at Reading and Kilmarnock.

A vacancy was filled up in the list of beneficiaries under the Argyll Naval Fund.

The minutes of a meeting of Finance Committee, held on the same day, were approved.

MEETING OF DIRECTORS, 1st DECEMBER 1898.

Present.—Ordinary Directors—Mr Howatson of Glenbuck; Sir Ralph Anstruther of Balcaskie, Bart.; Mr Paterson, Hill of Drip; Captain Thomas Hope of Bridge Castle; Rev. John Gillespie, LL.D., Mouswald Manse; Mr Cran, Kirkton; Mr C. H. Scott Plummer of Sunderland Hall; Mr George Dun, Easter Kincaple; Mr David

Wilson of Carbeth; Mr John M'Hutchen Dobbie, Campend; Mr W. H. Lumsden of Balmedie; Mr Robert F. Dudgeon of Cargen; Mr Walter Elliot, Hollybush; Mr Alex. Cross of Knockdon; Captain Clayhills Henderson of Invergowrie, R.N.; Mr W. T. Malcolm, Dunmore Home Farm; Mr Wm. Duthie, Tarves; Mr John M'Caig, Challoch; Mr Jonathan Middleton, Clay of Allan; Mr E. Hedley Smith, B.L., Whittinghame; Mr William Clark, Netherlea; Mr W. S. Ferguson, Pictstonhill; Mr R. Shirra Gibb, Boon. *Extraordinary Directors*—Mr James Hope, East Barns; Mr Gavin Jack, Swanston; Sir Robert Menzies of Menzies, Bart.; Mr John Scott Dudgeon, Longnewton; Mr C. M. Cameron, Balnakyle; Mr James Lockhart, Mains of Airies; Mr Wm. Ford, Fentonbarns; Mr John M. Martin, Edinburgh; Mr Andrew Hutcheson, Beechwood; Mr Wellwood Maxwell of Kirkennan. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Honorary Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr A. P. Aitken. *Law Agent*—James Auldjo Jamieson. *Veterinary Surgeon*—Principal Williams. Sir John Gilmour of Montrave, Bart., in the chair.

The SECRETARY reported apologies for the absence of the Hon. the Master of Polwarth, Humbie House; Sir Thomas D. Gibson-Carmichael of Skirling, Bart.; Sir Robert Moncreiffe of Moncreiffe, Bart.; Mr J. D. Fletcher of Rosehaugh; Major Gordon Gilmour of Graigmillar; Mr Gordon of Newton; Mr G. R. Glendinning, Hatton Mains; Mr Macpherson Grant, yr. of Ballindalloch; Mr Marr, Cairnbrogie; Mr Stirling of Keir.

The usual formal business having been transacted, the Directors took up matters regarding the

EDINBURGH SHOW, 1899.

A letter was read from Sir Francis Knollys intimating that H.R.H. the Prince of Wales had pleasure in giving his approval to a gold medal being offered as a memento of his presidency and visit.

Mr JAMES HOPE intimated special prizes for the best and second-best Hunter of any age in any class, the property of a tenant-farmer, and regularly hunted with any pack of foxhounds in Scotland in season 1898 99.

Captain CLAYHILLS HENDERSON, R.N., intimated special prizes amounting to £27 for Hunter brood mares with foal at foot.

Show Committee.—Minutes of meetings of this Committee, held on 1st November and 1st December, were submitted.

Mr LUMSDEN, Balmedie, called attention to the defective reading of the regulation regarding the exhibition of brood mares, and after some discussion a motion by Dr GILLESPIE, seconded by Mr LUMSDEN, was proposed, to the effect that mares in the brood class must be nursing a foal at foot, either their own or another's.

Mr MARTIN pointed out that this might probably conflict with some existing regulations, and it would be better to remit the matter to the Shows Committee.

The CHAIRMAN thought they were going to open up a wide door by passing a regulation of this kind, as it would admit of mares being shown with foals other than their own.

Mr FORD moved that the mares must have nursed their own foals regularly.

Mr HUTCHESON seconded.

Mr W. S. FERGUSON supported Dr Gillespie's motion. The only object of that motion was to prevent a yeld mare being shown in the milk class. They all knew that if a mare foaled a dead foal it was better for herself that she should nurse a foal, and if she had done that it did not matter whether the foal was her own or that of another mare. The point was to secure that all mares entered in the milk class should be actually in milk and nursing a foal.

On a division, 12 voted for Mr Ford's motion and 20 for Dr Gillespie's.

Prizes were introduced for Jersey cattle: otherwise the prizes in the Cattle, as in the Draught Horse classes, remain as at Kelso.

Hunter Classes.—On the recommendation of the Shows Committee that the prize-money in the Hunter classes be increased by £53, Mr Alex. Cross moved that the prize-list for Hunters (including Hunter brood mares) remain as at Kelso. He did not think that increasing the prize-money would have any effect in increasing the number of entries of Hunters.

Mr FERGUSON seconded the motion. They put up a liberal premium list at Kelso, and they had got very little encouragement.

Sir JAMES GIBSON-CRAIG, speaking in support of the recommendation of the Shows Committee, referred to the success of the Hunter classes at the Edinburgh Show. No doubt many hunting horses were shown at other shows, because they went there to be exhibited in the way of business; but this was not possible at the Highland Society, and their reason for proposing to give prize-money so liberally was to endeavour to bring out a large entry.

Sir **Ralph Anstruther** spoke in the same sense.

Mr **Scott Plummer** desired that some of the money proposed to be added should be devoted to the younger classes, and that older classes remain as before. What they wanted to do was to encourage farmers to breed hunting horses.

Dr **Gillespie** supported Mr Cross's amendment, and mentioned that the Edinburgh Association, to which Sir James Gibson-Craig had referred, only gave £10 as a first prize, and at that got a large entry.

Sir **James** said that was for one day's show.

Dr **Gillespie** agreed, and said that if he could believe that by increasing the prize-money they would have a large entry, he would not oppose the increase: but their experience at Kelso showed that liberal prize-money did not have a good result in the case of this breed.

On a division, 10 voted for the recommendation to increase the prize-money, and 16 for Mr Cross's amendment that the prize-money remain as at Kelso. The amendment was therefore carried.

Hackneys.—It was agreed to increase the prizes given by the Society for Hackneys to £190, in view of the fact that an additional sum of £62 had been raised by Mr Martin in aid of the prizes in these classes.

Roadsters.—The Committee recommended that the class for Roadsters remain as at Kelso.

Mr **Scott Plummer** moved that they be deleted, and Mr **Lumsden** seconded; and on a division, 18 supported the recommendation of the Committee and 5 the amendment. The class, therefore, remains as at Kelso; also the classes for ponies and driving.

Sheep.—In this section the prize-money throughout remains as at Kelso, except that the Suffolk-Downs are put on the same platform as Oxford-Downs.

Swine are as at Kelso.

Dairying.—The Show Committee recommended that the classes for cheese be deleted, and after some conversation this was agreed to.

The **Secretary** made a statement in regard to butter-making competitions, in connection with the Mid-Lothian County Council, which have been a feature of the Edinburgh Association Show for several years. It has been suggested that the Highland Society should continue this competition, seeing that the Edinburgh Association had given up their show for this year.

Mr **Hutcheson** spoke in favour of this, and also desired that there should be an open competition for the whole of Scotland, in addition to the competition restricted to the county of Mid-Lothian.

Sir **Ralph Anstruther** supported this idea.

Dr **Gillespie** asked the Directors to consider what the cost of a proposal of this kind would be. He said it would be £200.

This was called in question by several members, but the Doctor stuck to his point. They would have to provide utensils, and if there was to be a large entry they would require to provide a very large pavilion for the carrying on of the work. He did not think the game worth the candle. He therefore moved that they continue the work of the Edinburgh Association, and have a competition restricted to Mid-Lothian only.

Mr **Clark** seconded.

Mr **Lockhart** asked if the same arrangements would not do for both.

The **Secretary** explained that they would require much more space for the one than for the other.

Mr **Hutcheson** considered that even if the cost should be £200 they ought to have a great central competition, and they were not doing their duty to the dairying interest if they did not do this.

The **Secretary** having been appealed to, said that to have this competition might require a pavilion 150 feet long. These competitions had been dropped both in Dublin and at the Royal English Shows, on the ground that they are chiefly spectacular, and for practical purposes are not worth the cost.

A vote having been taken, 16 voted for Dr Gillespie's motion and 12 for Mr Hutcheson's.

Implement Trials.—The special Committee appointed at last meeting reported in regard to the broad remit made to them. They suggested that in the Edinburgh Show there should be an exhibition of oil-engines at work, such as are suitable for use in ordinary farms. They also suggested that a trial of manure-distributors be held in the autumn, at a time and place to be afterwards fixed, and that it should be remitted to the Shows Committee to make arrangements and regulations for both of these trials. This was unanimously agreed to.

A special report having been given regarding the Royal pavilion, committee-room, and the members' pavilion, the appointment of judges was delayed until the close of meeting in Committee.

CLIPPING SHEEP.

A communication was read from the National Sheep Breeders' Association in the following terms: "That inasmuch as the shearing regulations in respect to sheep shown at the Royal and other summer shows are unsatisfactory, it is desirable to do away with all restrictions."

Mr W. S. **FERGUSON** moved that this recommendation be adopted. The existing rule on the subject was not worth the paper it was printed on. The decision as to whether sheep were properly clipped should be left to the judges, who might be trusted to know whether anything unfair had been done in this connection.

Mr **HOWATSON** seconded.

Sir **ROBERT MENZIES** said he had on former occasions brought under the notice of the Directors the folly of clipping Blackface sheep early in autumn, which necessitated their being kept in the house during the winter and spring. This tended to make these mountain sheep delicate, and that was not desirable. Some restrictions should be made upon the time that sheep were clipped.

The recommendation was then unanimously adopted.

MISS MURDOCH'S BEQUEST.

Intimation was made of a bequest by the late Miss Murdoch of Castleview Cottage, Blantyre, of a sum of £10 a-year for ten years to provide a special prize of £10 to the breeder of the best brood mare in the Highland Show—the prize to be named the "Robert Murdoch Prize." The lady referred to is a daughter of the late Mr Robert Murdoch, East Haughhead, and it was agreed to interpret the regulation as applicable only to Clydesdale brood mares. On this understanding the bequest was unanimously accepted.

PUBLICATION COMMITTEE.

The minute of meeting of this Committee was read by the Secretary.

Dr **GILLESPIE** explained the privileges of members in connection with the library of the Society. Not only could they consult it, but they were at liberty to borrow books from it. The library was very valuable as regards the old books it contained, but it was deficient in the supply of new books. Mr Macdonald had discretionary power to spend not more than £10 per annum in purchasing these. The accommodation for the library, however, was very inadequate, and it was necessary that they should consider the best plan for providing accommodation elsewhere than in Mr Macdonald's room. He therefore moved formally that it be remitted to the Finance Committee and the Publication Committee to consider and report as to how additional accommodation could be obtained.

Agreed.

SCIENCE COMMITTEE.

The minute of meeting of this Committee, held on the same day, was read and approved. It was agreed that each member should be entitled to have not more than one sample of water analysed each year at the reduced scale to members. A remit in regard to the sheep-feeding experiments was made to a Sub-Committee consisting of Dr Gillespie, Mr M'Caig, and Dr Aitken. Experiments in clover-sickness, to cost not more than £30, are to be continued; and the experiment in the use of farmyard manure is being carried out by Mr Shirra Gibb, and others will be asked to take part in them.

DISTRICT SOCIETIES.

A report in regard to grants to district shows was submitted.

PLOUGHING-MATCH REGULATIONS.

On the motion of Dr **GILLESPIE**, the Secretary was instructed to intimate to Ploughing-Match Associations that the Society's regulation requiring ploughing to be at the rate of a statute acre in ten hours must be strictly adhered to.

The Board then sat in Committee for the election of judges.

MEETING OF DIRECTORS—4TH JANUARY 1899.

Present.—Ordinary Directors—Mr Charles Howatson of Glenbuck; Mr Robert Paterson, Hill of Drip; Mr John Marr, Cairnbrogie; Rev. John Gillespie, LL.D., Mouswald Manse; Mr John Cran, Kirkton; Mr C. H. Scott Plummer of Sunderland Hall; Mr John Speir, Newton Farm; Mr George Dun, Easter Kincaple; Mr John M'Hutchen Dobbie, Campend; Mr Walter Elliot, Hollybush; Mr W. T. Malcolm, Dunmore Home Farm; Captain Robert Dundas, yr. of Arniston; Mr Jonathan Middleton, Clay of Allan; Mr William Clark, Netherlea; Mr W. S. Ferguson, Pictstonhill; Mr R. Shirra Gibb, Boon; Mr R. W. B. Jardine, yr. of Castlemilk; Mr Alexander M. Gordon of Newton. *Extraordinary Directors*—Mr James Hope, East Barns; Mr George R. Glendinning, Hatton Mains; Mr Gavin Jack, Swanston; Sir Robert Menzies of Menzies, Bart.; Mr William Ford, Fentonbarns; Sir Robert D. Moncreiffe of Moncreiffe, Bart.; Mr John M. Martin, Edinburgh; Mr Andrew Hutcheson, Beechwood; Mr John Wilson, Chapelhill; Mr Wellwood Maxwell of Kirkennan. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Honorary Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. Sir John Gilmour of Montrave, Bart., in the chair.

The SECRETARY reported apologies for the absence of Mr Cameron, Balnakyle; Mr Alexander Cross of Knockdon; Mr Scott Dudgeon, Longnewton; Mr R. F. Dudgeon of Cargen; Mr Duthie, Tarves; Mr J. Douglas Fletcher of Rosehaugh; Major Gorden Gilmour of Craigmillar; Mr Macpherson Grant, yr. of Ballindalloch; Captain Clayhills Henderson of Invergowrie, R.N.; Mr James Lockhart, Mains of Airies; Mr W. H. Lumsden of Balmedie; Mr John M'Caig, Challoch; Mr Stirling of Keir; Mr David Wilson of Carbeth.

The minutes of last meeting having been approved of, the CHAIRMAN wished all the members present a very happy New Year.

The minutes of meeting of Finance Committee of that day was submitted by the Secretary, and the usual abstract of accounts was placed on the table.

EDINBURGH SHOW.

A letter was read from the County Clerk of East Lothian intimating that his County Council had agreed to levy a voluntary assessment of ¼d. per £ on owners and occupiers.

It was stated that the West Lothian County Council could not see their way to raise funds by means of voluntary assessment, but Captain Hope, the Convener of the County, intimated by letter to the Secretary that he and Captain Stewart of Westwood were to make arrangements to have a collection made privately amongst owners and occupiers of land.

Premium List.—The first proof of the premium list was laid on the table.

SIR JAMES GIBSON-CRAIG moved that Rule 43, which reads as follows, "Horses entered as Hunters must be jumped if required by the judges," be deleted, as it had never been put in force.

This was unanimously agreed to.

Sir JAMES also raised the question of classification of hunting horses according to their weight. At the Dublin Show, and also at the London Hunter Show, horses which, in the opinion of the judges, had been wrongly classified as regards weight-carrying were disqualified for competition. Sir James suggested that the Highland and Agricultural Society should adopt the regulation which is in force at the Edinburgh Show—viz., that the judges should have power to classify the horses, so that if a horse which, in their opinion, is a heavy-weight appears in the light-weight class, he should not be disqualified from competing, but should be transferred to the class which the judges approved of.

Mr JAMES HOPE said that those who owned the horses ought to know best the class in which they should be entered, and he did not think it was for the judges to interfere in a matter of the kind.

Mr JOHN M. MARTIN seconded Sir James Gibson's proposal. It seemed to put them in a much less invidious position if they had power to transfer horses from one class to the other than when their only power was that of ruthless rejection.

Mr HOPE thought it practically amounted to giving a man two chances.

The CHAIRMAN said he could not see that. He did not get more than one chance, because he could only compete in one class. He thought it would not be wise for them to adopt the Dublin rule.

Mr JOHN WILSON asked if there was any precedent for judges having a duty of this kind put upon them. He thought it was a bad precedent to ask their judges to transfer stock from one class to another.

Ultimately Sir JAMES GIBSON-CRAIG'S proposal was agreed to.

Sir ROBERT MENZIES suggested that the ducks should have a champion medal for themselves, and the geese another, and this was agreed to.

Mr JOHN M. MARTIN proposed that the wording of the classes in the driving competitions be as follows—viz.: "Best yeld mare, filly, or gelding in harness," instead of "best horse in harness," the object being to exclude entire horses from competition in this class.

Agreed.

On the motion of Mr Martin, it was agreed to introduce a class for Shetland ponies—stallion, mare, filly, or gelding—under three years, with prizes of £5, £3, and £2.

Hunters.—Sir James Gibson-Craig moved that the Society offer the same amount in premiums for Hunters at Edinburgh as at Kelso. He explained how he came to make a motion of this kind. At last meeting this motion had been agreed to, but a class included in the premium list had since been provided for by Captain Clayhills Henderson, and as the premium list stood at present they would really be giving less for Hunters than at Kelso. His proposal was that the difference—viz., £27—should be distributed over the classes for two and three-year-old hunting horses.

This was agreed to.

Sir James then stated further that he and other friends were collecting money for the Hunters, as had been done by Mr Martin for subsidising the Hackney class, and they hoped to raise a sum of about £100. He asked that in that case two Prince of Wales gold medals be given for the best male and best female in the Hunting classes.

This was agreed to.

Several special prizes were intimated and accepted.

The Stewards were reappointed.

The forage contract was given to Mr Thomas Hutcheson, Broomhills.

Milking Shorthorns.

The following communication was read from the Shorthorn Society:—

14*th December* 1898.

Dear Sir,—In December 1897 the Council of this Society passed the following resolution, a copy of which was sent to you: "That the Council of the Shorthorn Society of Great Britain and Ireland strongly recommends that the three national societies—viz., the Royal, the Highland, and the Royal Dublin—and other prominent societies, should instruct the judges at their shows to make the milking capacity and form of udder one of the chief points in awarding prizes to pure-bred Shorthorn cows and heifers, and that the secretary be instructed to forward this resolution to the said societies." If your Society has adopted the above-mentioned resolution, instructing the judges at your Show to make the milking capacity and form of udder one of the chief points in awarding prizes to pure-bred Shorthorn cows and heifers, I have to ask if your Society will accept the sum of £15 as a first prize in a special class for pure-bred Shorthorn cows in milk, of any age, your Society agreeing to add £15—viz., £10 as a second prize and £5 as a third prize—in this class. The following conditions to apply to this class: All cows competing in this class must be eligible for, and entered in, Coates's Herd-Book, or their pedigrees sent for entry previous to the Show. No animal to be allowed to take more than one of these prizes offered by the Shorthorn Society. I shall be obliged if you will kindly inform me—(1) If your Society has, or will adopt, the resolution passed by the Council of this Society in December 1897, referred to above; and (2) if so, whether you will accept the prize of £15 from this Society, and that your Society will agree to add £15—viz., £10 second prize and £5 third prize—for a special class for pure-bred Shorthorn cows in milk, of any age, with the conditions given above.—I am, dear sir, yours truly,
E. J. Powell.

James Macdonald, Esq.,
Secretary, Highland and Agricultural Society.

It was stated that the Directors. at their meeting on the 5th January 1898, decided to take no action in regard to the resolution referred to above.

Mr Marr questioned whether it would be a wise thing for the National Society to accept a prize of this kind. It might not be out of place in a local or district show, but the National Society could not afford to treat the Shorthorns as if they were simply a dairy breed. He had no doubt that when a judge was looking at a cow he gave due weight to the form and capacity of her udder, and to set up the dairy properties as the principle point would be a departure not to be undertaken without wise consideration. The Shorthorn was a beef breed as well as a dairy breed, and if a man was qualified to judge he, no doubt, was quite capable of having regard to the breed in all its merits. He moved, therefore, that they take no action in this matter.

Mr W. S. Ferguson seconded.

Mr W. T. Malcolm supported the motion, which was unanimously agreed to.

Clipping Regulations.

Letters were submitted from the following breeders and exhibitors of Blackface sheep, protesting against the resolution come to at last meeting to abolish the clipping regulations. The signatories were—Mr John Anderson, Hillside, Moffat; Mr James Archibald, Overshiels; Messrs R. & J. Cadzow, Borland; Mr John Craig, Innergeldie; Mr John Craig, South Halls; Mr David M'Gibbon, Ardnacraig; Messrs Macmillan, Glencrosh; and Mr J. Johnstone, Hopes, Gifford.

Mr **Elliot** was proceeding to support the memorial, when

The **Chairman** called his attention to the fact that the Standing Orders would require to be suspended before the question could be discussed at all.

Mr **Martin** moved the suspension of the Standing Orders.

Mr **Jonathan Middleton** seconded.

Dr **Gillespie** moved that the Standing Orders be not suspended.

A vote was taken, when Dr Gillespie's motion was carried, and the subject was departed from.

Butter-Making Competitions.

Mr **Andrew Hutcheson**, in accordance with notice given as provided by Standing Order No. 38, moved as follows: "That, in view of its having been arranged to hold, at the Edinburgh Show next July, a butter-making competition open only to competitors from the county of Mid-Lothian, it is desirable that the Society should also hold a similar competition open to the whole of Scotland; that upon this ground the resolution of last meeting of the Board, negativing the proposal to hold an open butter-making competition, be rescinded; and that it be remitted to a Committee to arrange conditions for such a competition." In speaking to the motion, Mr Hutcheson said he went home from last meeting very much dissatisfied with the decision the Directors had arrived at in regard to the open butter-making competition at the Edinburgh Show, and the Directors would not be the gentlemen he took them for if they waited until the General Meeting to overturn what they had then done. If there had been no local competition it might have been a different thing to bring forward a proposal for an open competition, but they would stultify themselves in the eyes of the public altogether if, as the National Society, they provided means for a local competition and none for an open one. Some might think that the money which had been voted in this way might be better spent, but he would not ask the Directors to agree that there should always be a butter-making competition, but only in view of the circumstances this year that there should be an open competition as well as a confined one.

Sir **James Gibson-Craig** seconded the motion. In Mid-Lothian they had very practical experience of the value of these competitions. If they had not found that they were valuable they would not have spent so much money on them as they had done.

Dr **Gillespie** would not move an amendment unless some one called him to order and insisted on him doing so, but he desired to explain his position. Mr Hutcheson appeared before them not only as the importunate widow, but also as a very astute and somewhat designing widow setting her cap at them and giving them a little flattery. The only real argument he brought forward was that, seeing they were going to conduct a dairy competition for the county of Mid-Lothian, they ought to conduct an open competition; but a mistake had been made in representing that the Society was to hold a local competition. What the Highland Society did was to undertake to place facilities at the disposal of the local authorities for the conducting of the competition, which would have been held at their own show had it not been suspended for this year out of courtesy to the Highland Society. It was in order to maintain the continuity of the work of the local society. He quite agreed that these butter-making competitions might be useful for county purposes, but a society like the Highland could spend its money to much better advantage for the furtherance of dairying than having these competitions, which, after all, were chiefly interesting in a spectacular way. He desired to enter a caveat against any one saying that those who were not fascinated by these competitions were not impressed with the importance of dairy education. Some of them had grown grey in their efforts to improve dairy instruction, and were still anxious to promote really useful dairy education. They were already spending a great deal of money and time in dairy education, and he would gladly see them spending more, but in his opinion this was not the best way to do it.

Mr **W. S. Ferguson** said that if Dr Gillespie would not move an amendment, he would. He moved the previous question. He denied that these spectacular events in the showyard had any educative value whatever, and was strongly of opinion that they could spend money on the furtherance of education to much better advantage than by the method proposed by Mr Hutcheson.

Dr **Shirra Gibb** seconded this motion. He agreed entirely with Dr Gillespie in saying that those who were opposing Mr Hutcheson's proposal were not doing so out of any disregard for the importance of dairying. He had personally, in his own county, as Convener of the Technical Education Committee, taken a great deal of interest in the endeavours to improve butter-making, and he would continue to do so, but he did not think this spectacular demonstration amounted to much, or would help them much in this respect. Besides, he would be no party to stultify themselves as Directors by acting as Mr Hutcheson requested them to do at this time. He had no objection to the question being raised at the General Meeting if anybody chose to do so then, but he declined, as a Director, to follow Mr Hutcheson on this occasion.

On a vote being taken, 6 voted for the previous question and 15 for Mr Hutcheson's motion.

MACHINERY.

The **SECRETARY** reported the arrangements that had been made for trials of oil-engines and machines for distributing artificial manures. With regard to trials of machines for distributing artificial manures, it was remitted to a Committee, with powers to arrange for these being held probably in the month of July.

CONSULTING ENGINEER.

The Committee appointed on this subject recommended that meantime no appointment be made by the Board. Agreed.

SCIENCE COMMITTEE.

The **SECRETARY** read the minute of meeting of Science Committee held on the same day. Experiments are to be carried out with basic slag in different parts of the country, and on hill and other pastures—probable cost £200.

PLOUGHING MATCHES.

Dr **GILLESPIE** moved—"That a Committee be appointed to revise the regulations for ploughing competitions, and report to the Board any changes therein that may be considered desirable." He said the object he had in view was, if possible, to do away with so much handling of the furrows. He had been at ploughing matches at which the horses stood as long in the land-ends while the men were dressing the furrows as they were engaged in ploughing. Some of those who had written on the subject had stated that it was not practicable to plough a selected area in the time allowed, and the best solution of the whole matter was to remit the question to a Committee, with power to deal with it in every respect; and for this year the medals should be distributed as they had been in the past.

Mr **SPEIR** seconded.

Mr **JONATHAN MIDDLETON**, on understanding that Dr Gillespie was inclined to waive the question of time, moved that the time limit be five hours for half an acre. He thought five hours was quite sufficient to plough half an acre in any part of this country, and the Society was not moving with the times if it gave its medals to men who took any longer.

Mr **ELLIOT** seconded.

Mr **JOHN MARR** said the question was, whether the Society was to yield to the practice of taking more than five hours to plough half an acre, for he thought that was the amount of work they ought to get out of their men.

Mr **JOHN WILSON** was of opinion that a great deal depended on the width of the furrow. He was formerly of the same opinion as others that five hours was ample for half an acre; but he had been in Stirlingshire, where he had noticed some very excellent ploughing, and he went over to examine it, and found the furrows were only 6 inches wide, in place of 9 as in other parts. It was quite obvious that ploughmen could not get over the same ground with a furrow 6 inches wide as they could with one 9 inches, and he thought the practice in different parts of the country would need to be taken into consideration.

Mr **W. S. FERGUSON** said the question really was, whether they were to have good practical work or what was called prize work. In his opinion the man who could not plough an acre in ten hours was not worth having on any field, but no man could do that according to modern ideas of prize ploughing.

Mr **W. CLARK** said it was perfectly impossible to plough an acre in ten hours in the West Country. Eighteen hours to the acre had been allowed in some shows. He thought fourteen was absolutely necessary for prize ploughing.

Mr **W. T. MALCOLM** supported Dr Gillespie's idea, as ten hours was an impossible time in which to plough an acre of carse-land.

Mr **JONATHAN MIDDLETON** withdrew his motion, and Dr Gillespie's became the finding of the meeting. The following Committee was appointed—viz.: Mr W. T. Malcolm, Mr Robert Paterson, Mr J. M. Martin, Mr John Marr, Dr Gibb, Mr William Clark, Mr Middleton, Mr John M'Caig, Mr John Wilson, and Mr W. S. Ferguson. Mr Martin, Convener.

MISCELLANEOUS.

The SECRETARY reported officially regarding the minutes of a meeting of the joint Board on 8th December, and that the examination for the N.D.D. in 1899 would take place as usual at Kilmarnock on Monday, the 3rd October, and the three following days.

A letter from the Royal College of Veterinary Surgeons, regarding advertising by holders of the Society's veterinary diploma, was read, but no action was taken in regard to it.

A communication from the Meat Traders' Association, with regard to the condemning of tuberculous carcasses, was read, but consideration was postponed till next meeting.

MEETING OF DIRECTORS, 18TH JANUARY 1899.

Present.—Ordinary Directors—Mr Robert Paterson, Hill of Drip; Captain Thomas Hope of Bridge Castle; Mr David Wilson of Carbeth; Mr John M'Hutchen Dobbie, Campend; Mr Walter Elliot, Hollybush; Mr Alexander Cross of Knockdon; Mr W. T. Malcolm, Dunmore Home Farm; Mr Jonathan Middleton, Clay of Allan; Mr E. Hedley Smith, B.L., Whittinghame; Mr W. S. Ferguson, Pictstonhill; Mr Alexander M. Gordon of Newton; Mr John Cran, Kirkton. *Extraordinary Directors*—Major Robert Gordon Gilmour of Craigmillar; Mr James Hope, East Barns; Sir Robert Menzies of Menzies, Bart.; Mr William Ford, Fentonbarns; Mr John M. Martin, Edinburgh; Mr Andrew Hutcheson, Beechwood; Mr John Wilson, Chapelhill. *Treasurer*—Sir James H. Gibson-Craig of Riccarton, Bart. *Honorary Secretary*—Sir John Gilmour of Montrave, Bart. *Chemist*—Dr A. P. Aitken. *Auditor*—Mr William Home Cook, C.A. Sir John Gilmour of Montrave, Bart., in the Chair.

The SECRETARY reported apologies for the absence of Sir Robert Moncreiffe of Moncreiffe, Bart.; Mr Clark, Netherlea; Mr Duthie, Tarves; Dr Shirra Gibb, Boon; Rev. John Gillespie, LL.D., Mouswald Manse; Mr Jno. Macpherson Grant, yr. of Ballindalloch; Captain Clayhills Henderson of Invergowrie, R.N.; Mr Howatson of Glenbuck; Mr Jardine, yr. of Castlemilk; Mr James Auldjo Jamieson, W.S.

Minutes of preceding meeting of the 4th January were approved of.

EDINBURGH SHOW.

Special prizes from the Oxford-Down Sheep Breeders' Association of £10 in all, divided into three prizes of £5, £3, and £2, for the best pens of cross-bred lambs got by an Oxford-Down tup, were accepted.

Formal reports were submitted from the Science Sub-Committee and the Argyll Naval Fund Committee.

A letter was read from the Secretary of the Scottish Agricultural Benevolent Institution intimating that, in recognition of the Society's donation of £1000, the Directors had resolved to entitle one of its pensions the Highland and Agricultural Society Pension: this pension to go to the applicant receiving the largest number of votes at any election at which this particular pension is available.

The usual grant of £50 to the Lecturer on Forestry in the University of Edinburgh was recommended.

PROCEEDINGS AT GENERAL MEETINGS.

GENERAL MEETING, 15TH JUNE 1898.

The Right Hon. the EARL OF HADDINGTON, President of the Society, occupied the chair.

On the motion of the CHAIRMAN, H.R.H. the Duke of York was elected an honorary member of the Society.

ELECTION OF PRESIDENT.

The CHAIRMAN formally moved that H.R.H. the Prince of Wales be elected President of the Society for next year. The Prince had always taken an active interest in agriculture in general, and also in the Highland and Agricultural Society. He was well known as a successful breeder alike of cattle and horses. A high honour had been conferred upon their Society when the Prince had agreed, subject to their approval, to accept this office. He was sure they would agree to his appointment unanimously.

Agreed.

One hundred and seventy-eight noblemen and gentlemen were balloted for and admitted members.

OFFICE-BEARERS.

The other Office-Bearers were appointed as follows: *Vice-Presidents*—The Marquis of Lothian, K.T.; the Earl of Rosebery, K.G.; the Earl of Hopetoun; the Right Hon. Arthur James Balfour, M.P. *Ordinary Directors*—Mr E. Hedley Smith, Whittinghame; Mr William Clark, Netherlee Farm; Mr Archibald Stirling of Keir; Mr W. S. Ferguson, Pictstonhill; Mr R. Shirra Gibb, Boon; Mr R. W. B. Jardine, yr. of Castlemilk; Mr A. M. Gordon of Newton; Mr J. Douglas Fletcher of Rosehaugh. *Extraordinary Directors*—Lord Provost Mitchell Thomson; the Earl of Wemyss and March; Sir Thomas D. Gibson Carmichael of Skirling, Bart., M.P.; Sir William Dick Cunyngham of Prestonfield, Bart.; Sir Archibald Buchan Hepburn of Smeaton, Bart.; Major Gordon Gilmour of Craigmillar; Bailie Sloan; Mr James Hope, East Barns; Mr George R. Glendinning, Hatton Mains; Mr Gavin Jack, Swanston; Sir Robert Menzies of Menzies, Bart.; Mr John Scott Dudgeon, Longnewton; Mr C. M. Cameron, Balnakyle; Mr James Lockhart, Mains of Airies; Mr William Ford, Fentonbarns; Sir Robert D. Moncreiffe, Bart.; Mr John M. Martin of Auchendennan; Mr Andrew Hutcheson, Beechwood; Mr John Wilson, Chapelhill; and Mr Wellwood Maxwell of Kirkennan.

KELSO SHOW, 1898.

Sir JAMES H. GIBSON-CRAIG reported as to the arrangements for the Kelso Show, to be held on Tuesday, the 5th of July, and three following days. In most sections of live stock there is a large number of entries. As usual in the Border district, the sheep classes will be especially strong, notably Border Leicesters, Cheviots, Blackfaces, and Half-breds. Springwood Park has provided an ideal showyard, in which there will be ample room and the greatest comfort alike for visitors and exhibits.

The town of Kelso has spared no effort to ensure the success of the Show, and, as already known, contributes very handsomely towards its expenses, besides providing the show-ground free of rent to the Society. The County Councils of the Border districts have all aided the funds very liberally by the usual voluntary assessment; while the Border Union Agricultural Society and the Berwickshire Agricultural Association have both been good enough to promise handsome subscriptions. The North British Railway Company are constructing very extensive additions to the platform and other accommodation at Kelso railway station; while an excellent service of special trains and reduced railway fares have been arranged. Throughout the Borders generally the Show is looked forward to with the keenest interest, and, with favourable weather, a successful Show may be expected.

Approved.

EDINBURGH SHOW, 1899.

Sir **JAMES H. GIBSON-CRAIG** reported that the arrangements for the Edinburgh Show of next year are as well advanced as they could be at this date. His Royal Highness the Prince of Wales will attend the Show in his capacity as President of the Society for the year, and from the great and widespread interest already evinced in the visit of his Royal Highness to the National Agricultural Show of Scotland, it was confidently anticipated that 1899 would be a record year in the history of the Society. An excellent site has been obtained in the fine grazing-lands of Prestonfield, Newington, and the Society is in a very special sense indebted to the proprietor, Sir William Dick Cunyngham, Bart., and to Captain Burn, tenant of Prestonfield House, who have met the Society in the most handsome and public-spirited manner. The Society also owe a cordial vote of thanks to the tenants of the grazings, who, at much inconvenience to themselves, have been good enough to allow the Society the use of the ground for the Show.

Approved.

STIRLING SHOW, 1900.

Sir **JAMES H. GIBSON-CRAIG** reported that arrangements are progressing for the proposed Show at Stirling in 1900. The Board of Directors, in conjunction with the Town Council of Stirling and the Stirling Agricultural Society, had been making efforts with the object of inducing the Caledonian and North British Railway Companies to proceed at once with the erection of the much-needed new railway station at Stirling, so that it might be completed in time for the Show of 1900. Unfortunately it appears that there is not enough time for the completion of an entirely new station, but both the companies have resolved to make temporary arrangements which will amply meet the convenience of the public and the exhibitors.

Approved.

At this stage Lord Haddington vacated the chair, which was taken by Sir James Gibson-Craig.

SCOTTISH AGRICULTURAL BENEVOLENT INSTITUTION.

Captain **HOPE** moved that the meeting approve of the following resolution of the Directors of 2nd March 1898: "That, subject to the approval of the General Meeting in June 1898, an additional donation of £500, making in all £1000, be given by the Society to the funds of the Scottish Agricultural Benevolent Institution." Last year the Society had given a donation of £500 to the funds of this Institution, which was inaugurated to celebrate the Diamond Jubilee of her Majesty the Queen. The proposal had been made that this Society should give an annual subscription, and that proposal was remitted to the Finance Committee for their full consideration. Captain Hope read the minute of the Finance Committee on the subject as the best means of explaining the situation to the members. He submitted that the question had not received the support from the rank and file of agriculturists which it deserved. This year there had been 36 applicants for pensions, and the Directors had only been able to grant 16. The ages of these applicants ranged from 91 down to 70 years, so that it was quite apparent that there was plenty of room for the work of the Institution. He moved the approval of the Directors' minute.

Mr **ANDREW HUTCHESON**, in seconding the motion, said that he hoped the individual subscribers to the fund would now follow the example of the Society and double their subscriptions.

Mr J. **SCOTT DUDGEON** thought the Society had done its part well in the meantime, but he would not like it to go forth that this was the last grant they would ever give to the Institution.

The **CHAIRMAN** indicated that that was exactly what the Finance Committee wished to be understood. He certainly hoped that for a considerable number of years the question would not again be raised in the Society.

Captain CLAYHILLS HENDERSON sympathised with Mr Scott Dudgeon. He would like to see the door left, if not open, at least ajar.

Dr GILLESPIE sympathised with Mr Hutcheson's view. It had never yet got sufficient support, and, in his opinion, it never would until there were local committees intrusted with collecting in its aid. No better Society had been started in his time, and it would not do to trust too much to societies, such as the Highland, for support. He would like individuals to join, and pay their subscriptions.

The motion was unanimously adopted.

AGRICULTURAL EDUCATION.

Rev. Dr GILLESPIE gave in the usual report as to the Society's examination in Agriculture. Dr Gillespie also announced that the £10 given in prizes to the class of Agriculture in the University of Edinburgh had this year been awarded as follows: 1 (£4), John O. Peet, Lancashire; 2 (equal, £3 each), Alex. Grant, Banffshire, and J. W. Eastham, Lancashire.

CHEMICAL DEPARTMENT.

Dr SHIRRA GIBB reported that the recent work done under the Chemical Department forms the subject of a number of reports contained in the volume of the 'Transactions' just issued. Of these the most important are two feeding experiments carried out on a large scale, one of them with fifty cattle, and the other with eight score of sheep. The object of the former was to test the value of the nutrient ratio as a guide in cattle-feeding, and at the same time to determine the relative feeding values of various feeding-stuffs. It was carried out at Mains of Laithers by Mr John Milne, who, on this as on former occasions, has earned the gratitude of the Society by putting at its disposal so large a number of his feeding stock, and securing that all the details of feeding were conducted in a thoroughly reliable manner. The results of this experiment confirm and amplify those of former years. They have shown that, while the nutrient ratio is of value in determining the relative feeding effect of substances of a similar kind, it fails to be a reliable guide in the regulation of a mixed dietary. Former experiments had shown that the progress of cattle-feeding on a mixed dietary depended more upon the total amount of digestible organic matter consumed than on the adherence to a certain nutrient ratio; but the results of the last experiment show that neither the one nor the other of these, nor both of them combined, can be relied upon as a sufficient guide in practice. It has been found that the specific character of the by-fodder employed, and the proportion which its amount bears to the main fodder, which, in this as in most cases, consisted of turnips and straw, modify the results in an important manner; and, moreover, it is shown in this, as in former experiments, that what may be called the idiosyncrasy of the feeding animal enters as a very disturbing factor, requiring for its elimination the employment of a large number of animals, even where every care has been taken to secure that they shall be as level as a practised eye can draw them.

The sheep-feeding experiments were again undertaken by Mr Adam Logan, Ferney Castle, and Mr A. G. Spence, Whitelaw. Their object was to test the relative feeding value of home-grown grain and bought-in feeding-stuffs. The latter were found to be more economical when fed to sheep consuming a full diet of turnips. It was also noticed on this, as on the previous occasion, that a more nitrogenous dietary increased the clip of wool, while a more farinaceous one increased the amount of loose fat.

The experiments with nitragin on various leguminous crops have all given negative results, showing that, however interesting the substance may be from a scientific point of view, it is of no importance in practical agriculture.

The first of a series of experiments to test the value of farmyard manure, when applied to the various crops in a rotation, has been undertaken by myself at Boon. It is intended to be followed by others in different parts of the country under as widely different conditions as possible, and the Directors would be glad to receive the co-operation of any members of the Society interested in the experiment. The Committee have also under consideration a series of experiments with basic slag, in order to determine the conditions under which that manure can be employed with advantage, and the Committee would welcome any information from members who have formed opinions regarding its use based upon practical experience.

It is satisfactory to note that during the past year members of the Society have, to a greater extent than in any previous year, taken advantage of the Society's scheme for supplying analyses of fertilisers, feeding-stuffs, agricultural products, &c., at reduced rates to its members.

Approved.

BOTANICAL DEPARTMENT.

Mr A. N. M'ALPINE, Botanist to the Society, reported as follows: I have the honour to report that, during the past season, I have examined over one hundred samples of clover and grass seeds. As a rule, the percentage of purity was very high, ranging from 95 to 100. The germination was as follows:—

	Maximum Percentage.	Minimum Percentage.
Red clover	100	90
Alsyke	98	85
White clover	98	84
Trefoil	99	95
Perennial ryegrass	98	88
Italian	98	70
Timothy	100	95
Meadow fescue	99	95
Cocksfoot	98	65
Hard fescue	93	80
Tall fescue	90	70

Approved.

FORESTRY DEPARTMENT.

Sir ROBERT MENZIES reported that the Forestry examinations were held from the 11th to the 15th April, when five candidates presented themselves, with the result that one obtained the first-class and three the second-class certificate.

A vote of thanks to the Chairman closed the proceedings.

GENERAL MEETING IN THE SHOWYARD AT KELSO,
6TH JULY 1898.

The Right Hon. the EARL OF HADDINGTON, President of the Society, in the chair.

The PRESIDENT, in the course of some introductory remarks, said he was again glad to have the opportunity of thanking them for the great honour they had conferred upon him in making him President of that important Society for the coming year. He assured them that he was not entirely unworthy of the high honour, because no one could appreciate such an honour in his own country more than he did. The duties of the President were certainly not very onerous. Light as they were, however, he found that he had not discharged them perhaps so well as some other former Presidents, but he hoped that his necessitated absence in England during a great part of the year must be his excuse for his non-attendance at several of the meetings. He had during his tenure of office had one very pleasurable duty to perform, for which purpose he had come from London a fortnight ago—the duty of proposing his Royal Highness the Prince of Wales as his successor in office, and also of his Royal Highness the Duke of York as an honorary member of the Society. He had the further pleasure of being able to say that the Prince had been graciously pleased to accept of the office of President for next year, and he had no doubt that under Royal auspices the exhibition at Edinburgh next year would be one of the best and the most brilliant in all respects that the Society had held for years, or perhaps during the long course of its existence.

Sir JAMES GIBSON-CRAIG said he had an announcement to make. That morning he had received a letter from the Duke of Buccleuch enclosing one from Sir Francis Knollys, intimating that the Prince of Wales would be able to attend the Show in Edinburgh in the first week of July next year. He felt that they ought again to express their thanks to the Duke of Buccleuch for his trouble in the matter. They knew the lifelong interest his Grace had taken in the Society, an interest which had been crowned by his success in securing Royal patronage for next year's Show.

Mr A. M. **Gordon** of Newton moved a cordial vote of thanks to Provost Smith and the Burgh Commissioners of Kelso for their assistance and co-operation in furthering the success of the Show by their liberal contributions to the funds, and by providing free of charge such a splendid field for a showyard. However able might be their Secretary, and no matter how great the zeal of the officials of the Society, without the assistance of good friends in the locality their efforts would be as naught, and therefore he thought they owed a deep debt of gratitude to the authorities of Kelso for the handsome reception they had given to the Society. They had given them one of the most beautiful show-grounds which he ever remembered seeing, and they had subscribed very handsomely to the Auxiliary Fund of the Society.

Mr **William Ford**, Fentonbarns, seconded.

Provost **Smith**, Kelso, returned thanks. Kelso, as they knew, was an agricultural town, and it had been recognised more than once as being the agricultural centre of that part of Scotland. He was sure he was expressing the feeling of the town when he said that such a Show placed a responsibility upon the town, and that responsibility had been expressed in the contributions which the town had made to the Society. He was exceedingly pleased, and he was sure every one in the town was exceedingly pleased, to know that that expression had found some favour with the members of the Society.

Mr **Maxwell**, yr. of Munches, proposed a hearty vote of thanks to the subscribers to the local funds, and to the donors of special prizes. The financial success of the Show depended upon two conditions. The first was good weather, and although they might have been a little discouraged on the opening day, he thought they had every promise of good weather for the remaining days of the Show. The second condition was that the different local authorities in the district where the Show was held should liberally support the Show. Here they had not only had the local authorities, but they had also had the Border Union Society, which had given a very handsome contribution to the funds of the Show; while they were also indebted to the Town Council and burgh of Kelso, and to the County Councils of Roxburgh, Berwick, Selkirk, and Peebles.

Captain **Clayhills Henderson**, Invergowrie, seconded, and the motion was adopted.

Mr J. M. **Martin**, Auchendennan, proposed a hearty vote of thanks to the Master of Polwarth as Convener, and to the other members of the Local Committee, for the assistance rendered in carrying out the Show.

Mr **Charles Howatson**, Glenbuck, seconded, and the motion was heartily adopted.

The **Master of Polwarth**, in replying, said that the arrangements were worked so smoothly by the officials of the Society that really little had been left to them; but he desired to say that they in the Borders were always delighted to welcome the members of the Highland and Agricultural Society from all parts of the country, even though they carried from their midst some of the spoils which they might have hoped to retain in their own hands. They were not discouraged, however, and the Border men hoped to make a raid upon the Society wherever they might meet in the future, and to maintain their position among the agriculturists of the land.

The Rev. Dr **Gillespie**, Mouswald, moved the following resolution: "That this meeting expresses its gratification with the proposal to devote to technical and agricultural education £35,000 of the equivalent grant now available for Scotland, and further resolves to make a recommendation to the Government in favour of a sufficient portion of that amount being specially set aside for the purpose of higher agricultural education, under the control of the Scottish Education Department." A short time ago, he said, the Board of the Society, when they became aware that an equivalent grant was to be distributed in Scotland, made a representation to the Government in favour of the claims of agricultural education being duly considered in the distribution of the money. He was sure that it had been a gratification to all of them to know that so large a proportion of it as £35,000 out of the £95,000 was proposed to be devoted to the technical and agricultural education branches, which had been far too much neglected in the past, not only in Scotland but throughout the whole United Kingdom.

Mr **Hutcheson**, Beechwood, Perth, seconded, and the motion was adopted.

Sir **Robert Menzies**, in proposing a vote of thanks to the Chairman, said that the Kelso Show might or might not be a financial success, but, for his own part, he had always held that it was the duty of the Society to spread itself out all over Scotland, and not to be deterred from visiting a district because the financial success of the meeting might not be so great as that of meetings in other localities. Whether their Show at Kelso paid or not, the Chairman had done his utmost to make it successful.

The **Chairman** returned thanks, and the proceedings then terminated.

ANNIVERSARY GENERAL MEETING, 18TH JANUARY 1899.

Sir JOHN GILMOUR of Montrave, Bart., in the chair.

NEW MEMBERS.

Seventy-three candidates were balloted for and admitted as members.

FINANCE.

Sir JAMES H. GIBSON-CRAIG, Treasurer, submitted the Accounts for the past year. The gross income of the Society for the year was £10,949, 8s. 5d.; the expenditure being £802, 5s. 2d. less than that sum. On the Kelso Show there was a deficiency of £353, 12s. 2d. An exceptional item of outlay in the past year was the sum of £500 voted to the Scottish Agricultural Benevolent Institution, making the Society's donation to that Institution up to the sum of £1000. On the other hand, there appears one exceptional item of income, a sum of £253, 7s. 2d., being income-tax refunded for the three years to April 1897, the Society having been successful in an application for exemption from that tax. For this they had to thank their Secretary.

ARGYLL NAVAL FUND.

Sir ROBERT MENZIES submitted the Accounts of the Argyll Naval Fund for 1897-98, which showed that the income for the year amounted to £241, 0s. 2d., while the expenditure was £200, made up by a grant of £40 to each of five naval cadets. During the past year there had been two vacancies in the list of those receiving grants by the promotion of Mr Leslie Menzies and Mr Colin Kenneth Maclean. The Directors, on the recommendation of the Committee, had appointed Mr James Douglas Campbell, son of Colonel Frederick Campbell, commanding 1st Argyll and Bute A.V.C., and Mr John Stewart Gordon Fraser, son of Mr Gordon Fraser, Nairn, and grandson of Mr Stewart of Ensay, Harris, to the vacancies.

KELSO SHOW, 1898.

Sir JAMES H. GIBSON-CRAIG submitted the report on the Kelso Show of last year. It was the fifth Show of the Society held at Kelso, and was, on the whole, the most successful Highland Show that has yet been held in the Border counties. In promoting the success of the Show the Society had received the heartiest co-operation from the town of Kelso, the counties of the Show district, and the local agricultural societies. The Town Commissioners of Kelso not only provided a beautiful showyard free of charge, but also supplied water, and contributed a sum of £300 to the funds of the Show. Then, by means of voluntary assessment, the various County Councils contributed as follows: Berwickshire, £327, 10s.; Roxburghshire, £343, 0s. 11d.; Peeblesshire, £105, 6s. 4d.; and Selkirkshire, £93, 16s. 3d.; while the Border Union Agricultural Society gave the handsome donation of £200, and the Berwickshire Agricultural Society the sum of £10. The local fund thus amounted in all to no less than £1379, 13s. 6d. The attendance of the public was small on the first and second days, but on the third and fourth days it was large for the district. The accounts show that the expenditure exceeded the receipts by about £353, which compares favourably with the adverse balance of £728 at Melrose in 1889, and of £1456 at Kelso in 1880. The display of live stock and implements was both extensive and of a high character. Sir James emphasised the fact that the contribution from the town of Kelso was the most liberal ever made to the Highland and Agricultural Society from any town which it had visited. He hoped other towns with much larger resources would emulate the example of Kelso.

EDINBURGH SHOW, 1899.

Sir JAMES H. GIBSON-CRAIG, Convener of the Local Committee, reported that the arrangements for the Show, to be held at Edinburgh on the 4th July and three following days, are well advanced. It was learned with the liveliest gratification that the Show is to be graced with the presence of Royalty. His Royal Highness the Prince of Wales had signified his intention of visiting the Show on the Wednesday and Thursday, the second and third days of the Show, and the people of Scotland will no doubt show their appreciation of the honour which his Royal Highness thus confers upon the Society by attending the Show in great numbers, and offering his Royal Highness a right royal welcome. The prize-list for the Show is almost completed, and will be issued early in February. It will be by far the most liberal prize-list that has ever been offered by the Society, with the single exception of the list for the great Centenary Show in 1884. The amount offered by the Society itself will be about £1000 more than at the Edinburgh Show in 1893, while the contributions by private donors are exceedingly handsome. An excellent site for the Show had been obtained on Sir William Dick Cunyngham's lands at Prestonfield, Newington. The Directors confidently anticipate that, with favourable weather, the Show will be a brilliant success, and some fresh "records" will be created.

Captain **Stewart** said he desired to call attention to the very extraordinary changes which had been made by the Directors in the regulations for the clipping of Blackface sheep. To begin with, he did not think the Directors had power to alter the rule which had so long been in force, because that rule was passed at a general meeting. The way in which the rule had been dealt with during the past ten years had been, in his opinion, subversive of the interests of Blackface sheep, which were the most important sheep stock in Scotland, and the regulations regarding them should not be dealt with simply on the initiative of one or two breeders, but after consultation with all the Blackface breeders. The opinion of the Society ought to be taken into account before a regulation which had worked so well was altered. He now asked that the Directors take the matter back, and that they ascertain the wishes of Blackface breeders in general with regard to this rule. It ought to be impossible to alter such a rule on such short notice. If the Directors would say that they would take these points into consideration, he would be perfectly satisfied. He moved that the matter be remitted to the Directors for reconsideration.

Mr C. J. N. **Fleming** seconded.

Sir **Robert Menzies** said he thought the decision they came to the other day, not to consider the remonstrance addressed to them, was a great mistake. The Chairman was perfectly right in his ruling on that occasion, but the Directors were quite wrong in acting on the initiative of the reverend Director, in refusing to suspend the Standing Orders.

Mr W. S. **Ferguson**, as the mover of the motion at the December meeting, desired to say that he did not admit that he knew nothing about Blackface sheep, but he quite admitted that he was not up to the quirks and dodges which had been brought to light since this matter was debated. If he had been, he frankly acknowledged that he would not have brought forward his motion at the December meeting. If he had understood then what he understood now he certainly would not have done so, and he thought the best thing to do was to accept Captain Stewart's motion.

This was unanimously agreed to.

STIRLING SHOW, 1900.

Sir **James H. Gibson-Craig** reported that arrangements are progressing in connection with the Stirling Show of 1900. Application had been made to the County Councils in the Stirling district to raise the usual contributions towards the local fund by means of voluntary assessment, and it was earnestly hoped that in this matter the excellent examples of the County Councils in the districts visited by the Highland Show during the past few years will be followed in the Stirling district. It was understood that the railway companies had come to an agreement as to the erection of a new railway station at Stirling, and it was hoped that the work of erection would be completed in time for the Show. Sir James desired to emphasise one difficulty about this Stirling Show, to which he called the attention of local parties. In spite of the promise by the railway companies to erect a new station, nothing whatever had yet been done towards that end. It was most important for the success of the Show that people should get to it and from it without difficulty, and so far there was no indication that the railway companies had realised that fact. It seemed to him that unless operations were begun at once the station could not now be ready in time for the Show.

DISTRICT SHOWS AND COTTAGES AND GARDENS.

Mr **Elliot**, Hollybush, submitted the report on district competitions, showing that, in 1898, 305 districts participated in grants of money and medals. The total expenditure under this head amounted to £454. For the current year the Directors proposed the following grants: (1) Under section 1, fifteen districts for grants of £12 each for cattle, horses, and sheep, and ten districts in intermediate competition with a grant of three silver medals each; (2) under section 2, nine districts for grants of £15 each for stallions; (3) twenty-five districts, two silver medals each; (4) ploughing competitions, 210 medals; (5) cottages and gardens, twenty districts, two medals each. The Directors also recommended the following special grants: £40 to the Highland Home Industries and Arts Association, £20 to the Kilmarnock Dairy Produce Show, £5 to the Shetland Agricultural Society, and £3 each to Orkney and East Mainland (Orkney) Agricultural Societies. The total sum recommended to be given in 1899 amounts to £500. Mr Elliot thought these grants did very good work indeed, and it was a pity more could not be done in that direction.

Mr A. M. **Gordon** seconded the adoption of the report, which was agreed to.

Chemical and Botanical.

Mr **Wilson** of Carbeth, Convener of the Science Committee, reported upon the operations of this Committee. He stated that the investigations which are at present the subject of experiment by the Science Committee are the following:—

(1) A feeding experiment with six score of sheep, to test the relative values of the various feeding-stuffs used as an adjunct to turnips in the South-West of Scotland. For the means of carrying out this important inquiry the Society is indebted to Mr M'Caig, Challoch, Leswalt, who put his land and stock at the service of the Committee, and is giving the matter his personal attention.

(2) The continuation of the experiment, the object of which is to determine to what crop in a five-year rotation it is most profitable to apply farmyard manure. It is being carried out at Boon, on five fields of very equal soil, under the immediate superintendence of Dr Shirra Gibb.

(3) An investigation into the cause of clover-sickness at Broomdykes, Chirnside, under the care of Mr James Somervail. A very complete series of tests has shown that the disease, as it occurs on that farm, is not due to any deficiency in the fertility of the soil, nor to any defect which can be remedied by the application of manures. Other probable causes are being investigated by the Botanist and Entomologist of the Society.

(4) An extensive series of experiments is now being undertaken to test the value of basic slag as a means of improving pastures and other grass-land, and to discover what are the conditions of soil favourable, or otherwise, to its use as a manure. The experiment also includes the application of superphosphate, potash salts, and lime, singly or in combination, and particular attention is being paid to the effects of these substances on hill pastures that have never been manured. Each experiment covers an acre of ground, and the manures are being supplied free of cost by the Society.

Mr **Wilson** emphasised the importance of these experiments—especially those with basic slag. As they were all aware, that particular form of applying phosphates had proved marvellously successful on certain kinds of hill-land, and had been somewhat disappointing on other kinds. They were very anxious to find out really where it was best to apply it, and where it would not effect any good. The expense of these experiments would be borne by the Society, but it would be as nothing compared with the information likely to be obtained from the experiments.

Forestry.

Sir **Robert Menzies** moved that the grant of £50 to the Lecturer in Forestry in the Edinburgh University be continued for the current year.

Captain **Stewart** seconded the motion, which was unanimously agreed to.

Education.

Mr **Cross** of Knockdon reported that at the examination held at the Dairy Institute, Kilmarnock, in the first week of October last for the National Diploma in Dairying there were fifteen candidates, of whom thirteen obtained the diploma. The experience regarding this national examination in dairying continued to be highly encouraging, and it was observed with satisfaction that a rising standard of education was displayed by the candidates. The next examination in Scotland will take place, as last year, at the Scottish Dairy Institute, Kilmarnock, on the first Monday of October and three following days. The Directors recommended that the grant of £60 to the Scottish Dairy Institute be continued for the current year.

Mr **Andrew Hutcheson** seconded the adoption of the report.

Publications.

Mr J. M. **Martin** reported that the volume of 'Transactions' for this year was now being printed, and would be issued to members next month, arrangements having been made to publish the volume earlier in the year than hitherto.

On the motion of Mr **James Hope**, a vote of thanks was unanimously passed to the chairman, and the meeting separated.

PREMIUMS

OFFERED BY

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND IN 1899

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GENERAL NOTICE.

THE HIGHLAND SOCIETY was instituted in the year 1784, and incorporated by Royal Charter in 1787. Its operation was at first limited to matters connected with the improvement of the Highlands of Scotland; but the supervision of certain departments, proper to that part of the country, having been subsequently committed to special Boards of Management, several of the earlier objects contemplated by the Society were abandoned, while the progress of agriculture led to the adoption of others of a more general character. The exertions of the Society were thus early extended to the whole of Scotland, and have, for the greater part of a century, been directed to the promotion of the science and practice of agriculture in all its branches

In accordance with this more enlarged sphere of action, the original title of the Society was altered, under a Royal Charter, in 1834, to THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND.

The leading purposes of the Institution are set forth in the following pages, where it will be found that Premiums are offered for Reports on almost every subject connected with the cultivation of the soil, the rearing and feeding of stock, the management of the dairy, the improvement of agricultural machinery and implements, the growth of timber, the extension of cottage accommodation, the application of chemical science; and the dissemination of veterinary information

Among the more important measures which have been effected by the Society are—

1. Agricultural Meetings and General Shows of Stock, Implements, &c, held in the principal towns of Scotland, at which exhibitors from all parts of the United Kingdom are allowed to compete
2. A system of District Shows instituted for the purpose of improving the breeds of Stock most suitable for different parts of the country, and of aiding and directing the efforts of Local Agricultural Associations.
3. The encouragement of Agricultural Education, under powers conferred by a supplementary Royal Charter, granted in 1856, and authorising "THE COUNCIL of the HIGHLAND AND AGRICULTURAL SOCIETY ON EDUCATION" to grant Diplomas to Students of Agriculture, and by the establishment of Bursaries. The Bursaries were discontinued in 1892.
4. The appointment of a chemist for the purpose of promoting the application of science to agriculture, and to superintend local experiments.
5. The advancement of the Veterinary Art, by conferring Certificates on Students who have passed through a prescribed curriculum, and who are found, by public examination, qualified to practise. Now terminated in accordance with arrangements with the Royal College of Veterinary Surgeons
6. The establishment of a Botanical Department.
7. The institution of a National Examination in Dairying, jointly with the Royal Agricultural Society of England
8. The appointment of Entomologist to advise members regarding insect pests
9. The institution of an Examination in Forestry for First and Second Class Certificates
10. The annual publication of the 'Transactions,' which comprehend papers by selected writers, Prize Reports, and reports of experiments, also an abstract of the business at Board and General Meetings, and other communications.
11. The management of a fund left by John, 5th Duke of Argyll (the original President of the Society), to assist young natives of the Highlands who enter Her Majesty's Navy.

CONSTITUTION AND MANAGEMENT

The general business of THE HIGHLAND AND AGRICULTURAL SOCIETY is conducted under the sanction and control of the Royal Charters, referred to above, which authorise the enactment of Bye Laws

The Office-Bearers consist of a President, Four Vice-Presidents, Thirty-two Ordinary and Twenty Extraordinary Directors, a Treasurer, an Honorary and an Acting Secretary, an Auditor, and other Officers

The Council on Education, under the Supplementary Charter, consists of Sixteen Members—Nine nominated by the Charter, and Seven elected by the Society. The Board of Examiners consists of Sixteen Members.

PRIVILEGES OF MEMBERS

MEMBERS OF THE SOCIETY ARE ENTITLED—

1. *To receive on application a free copy of the 'Transactions' annually.*
2. *To apply for District Premiums that may be offered.*
3. *To report Ploughing Matches for Medals that may be offered.*
4. *To Free Admission to the Shows of the Society.*
5. *To exhibit Live Stock and Implements at reduced rates.*[1]
6. *To have Manures and Feeding-Stuffs analysed at reduced fees.*
7. *To have Seeds tested at reduced fees.*
8. *To have Insect Pests and Diseases affecting Farm Crops inquired into.*
9. *To attend and vote at General Meetings of the Society.*
10. *To vote for the Election of Directors, &c., &c.*

ANALYSIS OF MANURES AND FEEDING-STUFFS

The Fees of the Society's Chemist for Analyses made for Members of the Society shall, until further notice, be as follow:—

The estimation of *one* ingredient in a manure or feeding-stuff	5s.
The estimation of *two or more* ingredients in a manure or feeding-stuff . . .	10s.

These charges apply only to analyses made for the sole and private use of Members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

The Society's Chemist, if requested, also supplies valuations of manures, according to the Society's scale of units.

SEEDS, CROP DISEASES, INSECT PESTS, &c.

The rates of charges for the examination of plants and seeds, crop diseases, insect pests, &c., will be found on pages 47 and 48.

ELECTION OF MEMBERS

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January and June. It is not necessary that the proposer should attend the Meeting.

CONDITIONS OF MEMBERSHIP

The ordinary annual subscription is £1, 3s. 6d , and the ordinary subscription for life-membership is £12, 12s.; or after ten annual payments have been made, £7, 7s. Proprietors farming the whole of their own lands, whose rental on the Valuation Roll does not exceed £500 per annum, and all Tenant-Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment of £5, 5s., or, after ten annual payments have been made, by one payment of £3, 3s.[2] Subscriptions are payable on election, and afterwards annually in January.

Members are requested to send to the Secretary the names and addresses of Candidates they have to propose (stating whether the Candidates should be on the £1, 3s. 6d. or 10s. list).

JAMES MACDONALD, *Secretary.*

3 GEORGE IV. BRIDGE, EDINBURGH.

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[1] Firms are not admitted as Members; but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

[2] Candidates claiming to be on the 10s. list must state under which of the above designations they are entitled to be placed on it.

ESTABLISHMENT FOR 1898-99

President.

HIS ROYAL HIGHNESS THE PRINCE OF WALES, K.G.

Vice-Presidents.

Marquis of Lothian, K.T., Newbattle Abbey, Dalkeith.
Earl of Rosebery, K.G., Dalmeny Park, Edinburgh.
Earl of Hopetoun, Hopetoun House, South Queensferry.
Right Hon. Arthur James Balfour of Whittinghame, M.P., Prestonkirk.

Ordinary Directors.

Year of Election.	
1895	Charles Howatson of Glenbuck, Glenbuck. Sir Ralph Anstruther of Balcaskie, Bart., Pittenweem. Robert Paterson, Hill of Drip, Stirling. Captain Thomas Hope of Bridge Castle, Westfield, Linlithgowshire. John Marr, Cairnbrogie, Old Meldrum. Rev. John Gillespie, LL.D., Mouswald Manse, Ruthwell, R.S.O. John Cran, Kirkton, Bunchrew, Inverness. C. H. Scott Plummer of Sunderland Hall, Selkirk.
1896	John Speir, Newton Farm, Newton, Glasgow. George Dun, Easter Kincaple, St Andrews. David Wilson of Carbeth, Killearn. John M'Hutchen Dobbie, Campend, Dalkeith. W. H. Lumsden of Balmedie, Aberdeenshire. Robert F. Dudgeon of Cargen, The Grange, Kirkcudbright. John Macpherson Grant, Old Milton, Kingussie. Walter Elliot, Hollybush, Galashiels.
1897	Alexander Cross of Knockdon, 19 Hope Street, Glasgow. Captain Clayhills Henderson of Invergowrie, R.N., Dundee. W. T. Malcolm, Dunmore Home Farm, Larbert. Captain Robert Dundas, yr. of Arniston, Kirkhill, Gorebridge. William Duthie, Tarves, Aberdeenshire. John M'Caig, Challoch, Leswalt. Jonathan Middleton, Clay of Allan, Fearn, Ross-shire. The Master of Polwarth, Humbie House, Upper Keith.
1898	E. Hedley Smith, B.L., Whittinghame, Prestonkirk. William Clark, Netherlea Farm, Cathcart. Archibald Stirling of Keir, Dunblane. W. S. Ferguson, Pictstonhill, Perth. R. Shirra Gibb, Boon, Lauder. R. W. B. Jardine, yr. of Castlemilk, Lockerbie. Alexander M. Gordon of Newton, Insch, Aberdeenshire. J. Douglas Fletcher of Rosehaugh, Avoch, R.S.O., Ross-shire.

Extraordinary Directors.

1898 The **Earl of Wemyss and March**, Gosford, Longniddry.
Right Hon. **Mitchell Thomson**, Lord Provost of Edinburgh.
Sir **Thomas D. Gibson-Carmichael** of Skirling, Bart., M.P., Castle-Craig, Dolphinton.
Sir **William Dick Cunyngham** of Prestonfield, Bart., Edinburgh.
Sir **Archibald Buchan Hepburn** of Smeaton, Bart., Prestonkirk.
Major **Robert Gordon Gilmour** of Craigmillar, Edinburgh.
Bailie **Thomas Sloan**, 3 Hart Street, Edinburgh.
James Hope, East Barns, Dunbar.
George R. Glendinning, Hatton Mains, Kirknewton.
Gavin Jack, Swanston, Colinton.

1896 Sir **Robert Menzies** of Menzies, Bart., Camserney, Aberfeldy.
John Scott Dudgeon, Longnewton, St Boswells.

1897 **C. M. Cameron**, Balnakyle, Munlochy.
James Lockhart, Mains of Airies, Stranraer.
William Ford, Fentonbarns, Drem.
Sir **Robert D. Moncreiffe** of Moncreiffe, Bart., Bridge of Earn.

1898 **John M. Martin**, 32 Ann Street, Edinburgh.
Andrew Hutcheson, Beechwood, Perth.
John Wilson, Chapelhill, Cockburnspath.
Wellwood Maxwell of Kirkennan, Dalbeattie.

Office-Bearers.

Sir **James H. Gibson-Craig** of Riccarton, Bart., *Treasurer.*
Sir **John Gilmour** of Montrave, Bart., *Honorary Secretary.*
James Macdonald, F.R.S.E., *Secretary.*
Rev. **Archibald Scott**, D.D., *Chaplain.*
Andrew P. Aitken, D.Sc., 8 Clyde Street, *Chemist.*
William Home Cook, C.A., *Auditor.*
Todd, Murray, & Jamieson, W.S., *Law Agents.*
A. N. M'Alpine, 60 John Street, Glasgow, *Consulting Botanist.*
R. S. MacDougall, M.A., D.Sc., 3 Mertoun Place, *Consulting Entomologist.*
John Macdiarmid, *Clerk.*
Edward M. Cowie, *Second Clerk.*
William Williams, F.R.C.V.S., *Professor of Veterinary Surgery.*
William Blackwood & Sons, 45 George Street, *Printers and Publishers.*
Keith & Co., 65 George Street, *Advertising Agents.*
G. Waterston & Sons, 56 Hanover Street, *Stationers.*
Thomas Smith & Sons, 47 George Street, *Silversmiths.*
Alexander Kirkwood & Son, 9 St James' Square, *Medallists.*
John Watherston & Sons, *Inspectors of Works.*
William Simpson, *Messenger.*

Chairman of Board of Directors.

Sir **John Gilmour** of Montrave, Bart.

Chairmen of Committees.

1. *Argyll Naval Fund* . .	Captain G. D. **Clayhills Henderson**.
2. *Finance, Chambers, and Law*	Sir **James H. Gibson-Craig**, Bart.
3. *Publications* . . .	Rev. **John Gillespie**, LL.D., Mouswald Manse.
4. *Shows*	Sir **James H. Gibson-Craig**, Bart.
Science	**David Wilson** of Carbeth.
[1] *General Purposes* . .	Sir **James H. Gibson-Craig**, Bart.

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COMMITTEES FOR 1898-99

1. ARGYLL NAVAL FUND.

Capt. G. D. Clayhills Henderson of Invergowrie, R.N., Dundee, *Convener.*
Sir David Baird of Newbyth, Bart., Prestonkirk.
Sir Robert Menzies of Menzies, Bart., Camserney, Aberfeldy.
John Maclachlan of Maclachlan, 48 Castle Street, Edinburgh.

2. FINANCE, CHAMBERS, AND LAW.

Sir James H. Gibson-Craig of Riccarton, Bart., *Convener.*
Rev. John Gillespie, LL.D., Mouswald Manse, Ruthwell, R.S.O.
G. R. Glendinning, Hatton Mains, Kirknewton.
John Scott Dudgeon, Longnewton, St Boswells.
Alexander Cross of Knockdon, 19 Hope Street, Glasgow.
A. M. Gordon of Newton, Insch, Aberdeenshire.
Captain Robert Dundas, yr. of Arniston, Kirkhill, Gorebridge.
John M'Hutchen Dobbie, Campend, Dalkeith.
Sir John Gilmour of Montrave, Bart., Hon. Secretary, *ex officio.*
William Home Cook, C.A., Auditor, *ex officio.*

3. PUBLICATIONS.

Rev. John Gillespie, LL D , Mouswald Manse, Ruthwell, R.S.O., *Convener.*
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John Speir, Newton Farm, Newton, Glasgow.
David Wilson of Carbeth, Killearn.
R. Shirra Gibb, Boon, Lauder.

4. SHOWS.

Sir James H. Gibson-Craig of Riccarton, Bart., Currie, *Convener.*
John M. Martin, 32 Ann Street, Edinburgh, *Vice-Convener.*
Sir Robert Menzies of Menzies, Bart., Camserney, Aberfeldy.
John Cran, Kirkton, Bunchrew, Inverness.
Walter Elliot, Hollybush, Galashiels.
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Sir John Gilmour of Montrave, Bart., Leven.
W. H. Lumsden of Balmedie, Aberdeen.
John Marr, Cairnbrogie, Old Meldrum.
James Lockhart, Mains of Airies, Stranraer.
Jonathan Middleton, Clay of Allan, Fearn.
R. Sinclair Scott, Burnside, Largs.
W. S. Ferguson, Pictstonhill, Perth.
George Dun, Easter Kincaple, St Andrews.
Alex. M. Gordon of Newton, Insch, Aberdeenshire.
Alex. Cross of Knockdon, 19 Hope Street, Glasgow.
W. T. Malcolm, Dunmore Home Farm, Larbert.

G. R. Glendinning, Hatton Mains, Kirknewton.
J. D. Fletcher of Rosehaugh, Avoch, R.S.O., Ross-shire.
James Hope, East Barns, Dunbar.
C. M. Cameron, Balnakyle, Munlochy.
Charles Howatson of Glenbuck, Glenbuck.
John Wilson, Chapelhill, Cockburnspath.
William Duthie, Tarves, Aberdeenshire.
Robert F. Dudgeon of Cargen, The Grange, Kirkcudbright.
John M'Hutchen Dobbie, Campend, Dalkeith.
John M'Caig, Challoch, Leswalt.
R. W. B. Jardine, yr. of Castlemilk, Lockerbie.
William Clark, Netherlea Farm, Cathcart.

5. SCIENCE.

David Wilson of Carbeth, Killearn, *Convener.*
Jonathan Middleton, Clay of Allan, Fearn, Ross-shire, *Vice-Convener.*
G. R. Glendinning, Hatton Mains, Kirknewton.
R. Shirra Gibb, Boon, Lauder.
The Hon. The Master of Polwarth, Humbie House, Upper Keith.
W. S. Ferguson, Pictstonhill, Perth.
John Speir, Newton Farm, Newton, Glasgow.
John Scott Dudgeon, Longnewton, St Boswells.
Andrew Hutcheson, Beechwood, Perth.
Alex. Cross of Knockdon, 19 Hope Street, Glasgow.
Rev. John Gillespie, LL.D., Mouswald Manse, Ruthwell, R.S.O.
John Wilson, Chapelhill, Cockburnspath.
Sir John Gilmour of Montrave, Bart., Leven, Fife.
James Hope, East Barns, Dunbar.
Sir Ralph Anstruther of Balcaskie, Bart., Pittenweem.
John M'Hutchen Dobbie, Campend, Dalkeith.
John M'Caig, Challoch, Leswalt.
E. Hedley Smith, B.L., Whittinghame, Prestonkirk.
Captain Clayhills Henderson of Invergowrie, R.N., Dundee.
Dr Aitken, Chemist, *ex officio.*
A. N. M'Alpine, Botanist, *ex officio.*
Professor Williams, *ex officio.*

6. GENERAL PURPOSES.

Sir James H. Gibson-Craig of Riccarton, Bart., Currie, *Convener.*
The Hon. The Master of Polwarth, Humbie House, Upper Keith.
G. R. Glendinning, Hatton Mains, Kirknewton.
Alex. M. Gordon of Newton, Insch, Aberdeenshire.
Rev. John Gillespie, LL D., Mouswald Manse, Ruthwell, R.S.O.
James Hope, East Barns, Dunbar.
John M. Martin, 32 Ann Street, Edinburgh.
John M'Hutchen Dobbie, Campend, Dalkeith.

7. NATIONAL DIPLOMA IN DAIRYING.

Alex Cross of Knockdon, 19 Hope Street, Glasgow, *Convener.*
John Speir, Newton Farm, Newton, Glasgow.
David Wilson of Carbeth, Killearn.
J. H. Turner, Portland Estates Office, Kilmarnock.
James Macdonald, *Secretary.*

The President, Vice-Presidents, the Treasurer, Honorary Secretary, and Chairman of Directors are members *ex officiis* of all Committees.

General Meetings.—By the Charter the Society must hold two General Meetings each year, and, under ordinary circumstances, they are held on the third Wednesday of the months of January and June, at one o'clock, in the Society's Hall, 3 George IV. Bridge, for the election of Members and other business. Twenty a quorum.

By a resolution of the General Meeting on 15th January 1879, a General Meeting of Members is held in the Showyard on the occasion of the Annual Show. This year it will be held at Edinburgh, on Wednesday, 5th July, at an hour to be announced in the programme of the Show.

With reference to motions at General Meetings, Bye-Law No. 10 provides—"That at General Meetings of the Society no motion or proposal (except of mere form or courtesy) shall be submitted or entertained for immediate decision unless notice thereof has been given a week previously to the Board of Directors, without prejudice, however, to the competency of making such motion or proposal to the effect of its being remitted to the Directors for consideration, and thereafter being disposed of at a future General Meeting."

General Show at Edinburgh—4th, 5th, 6th, and 7th July.—Entries close for Implements, 1st May; Stock, Poultry, and Dairy Produce, 29th May.

Directors' Meetings.—The Board of Directors meet on the first Wednesday of each month from November till June inclusive, at half-past one o'clock P.M., and occasionally as business may require, on a requisition by three Directors to the Secretary, or on intimation by him. Seven a quorum.

Nomination of Directors.—Meetings of Members, for the purpose of nominating Directors to represent the Show Districts on the Board for the year 1899-1900, will be held at the places and on the days after mentioned:—

1. Edinburgh, 3 George IV. Bridge,	Wednesday, 15th Feb., at 2.
2. Glasgow, North British Station Hotel,	Wednesday, 22nd Feb., at 1.
3. Stirling, Golden Lion Hotel,	Friday, 24th Feb., at 1.30.
4. Perth, Salutation Hotel,	Friday, 3rd March, at 2.
5. Kelso, Cross Keys Hotel,	Friday, 10th March, at 12.30.
6. Dumfries, King's Arms Hotel,	Wednesday, 15th March, at 1.
7. Aberdeen, Imperial Hotel,	Friday, 17th March, at 12.
8. Inverness, Caledonian Hotel,	Tuesday, 21st March, at 12.30.

The nomination of Proprietors or other Members paying the higher subscription must be made in the 1st, 2nd, 4th, and 5th Districts; and the nomination of Tenant-Farmers or other Members paying the lower subscription, in the 3rd, 6th, 7th, and 8th Districts.

Committee Meetings.—Meetings of the various Committees are held as required.

The Examinations for 1899 for the Society's Diploma and Certificate in Agriculture and Certificates in Forestry are fixed to be held as follows: Forestry written, 10th and 11th April; Agricultural written, 12th and 13th April; Oral, both subjects, 14th April.

AGRICULTURAL EDUCATION

CERTIFICATE AND DIPLOMA IN AGRICULTURE.

COUNCIL ON EDUCATION.

By a Supplementary Charter under the Great Seal, granted in 1856, the Society is empowered to grant Diplomas.

Members of Council named by Charter.

The President of the Highland and Agricultural Society—*President.*
The Lord Justice-General—*Vice-President.*

The Lord Advocate.
The Dean of Faculty.
The Professor of Agriculture.
The Professor of Anatomy.
The Professor of Botany.
The Professor of Chemistry.
The Professor of Natural History.

Members of Council nominated by Society.

The Master of Polwarth.
Sir James H. Gibson-Craig of Riccarton, Bart.
R. G. Wardlaw Ramsay of Whitehill.
W. J. Maxwell, yr. of Mun[illegible] Terraughtie, Dumfries.
Rev. John Gillespie, LL.D., Mouswald, Ruthwell, R.S.O.
John Marr, Cairnbrogie, Old Meldrum
Alexander Cross of Knockdon.

Standing Acting Committee.

The Lord Justice-General—*Convener.*

The Professor of Agriculture.
The Professor of Botany.
The Professor of Chemistry.
Rev. John Gillespie, LL.D., of Mouswald.
R. G. Wardlaw Ramsay of Whitehill.

Board of Examiners.

Science and Practice of Agriculture.—Professor Wallace, University, Edinburgh; James Hope, East Barns, Dunbar; James Biggar, Grange Farm, Dalbeattie; Professor Wright, Glasgow and West of Scotland Technical College, 60 John Street, Glasgow; George R. Glendinning, Hatton Mains, Kirknewton; and James I. Davidson, Saughton Mains, Corstorphine, Edinburgh.

Botany.—A. N. M'Alpine, Technical College, 60 John Street, Glasgow, and Dr R. S. M'Dougall, Edinburgh.

Chemistry, Physics, and Agricultural Chemistry.—Dr A. P. Aitken, Edinburgh; Dr William Craig, Edinburgh.

Natural History.—Professor Cossar Ewart, Edinburgh, and J. A. Thomson, M.A., 11 Ramsay Gardens, Edinburgh.

Veterinary Science.—Prof. Williams, Edinburgh; Principal Dewar, Royal (Dick) Veterinary College, Clyde Street, Edinburgh; Principal M'Call, Veterinary College, Buccleuch Street, Glasgow; and R. Rutherford, F.R.C.V.S., 12 Bread Street, Edinburgh.

Field-Engineering.—David Alan Stevenson, C.E., Edinburgh, and A. W. Belfrage, C.E., Edinburgh.

Book-keeping.—William Home Cook, C.A., Edinburgh, and J. Wilson Brodie, C.A., Edinburgh.

The maximum number of marks in each subject is 100. In Agriculture, 75 marks qualify for Diploma and 60 for Certificate; in other subjects, 60 for Diploma and 40 for Certificate.

BYE-LAWS.

I. That, in terms of the Charter, the Society shall nominate seven members to act on the Council on Education.

II. That the Council shall appoint a Board of Examiners on the following subjects:—Science and Practice of Agriculture; Botany; Chemistry; Natural History; Veterinary Science; Field-Engineering; and Book-keeping.

III. That the Examination shall be both written and oral, and that the value of the answers shall be determined by numbers.

IV. That there be two grades in the Examination,[1] (1) "First-Class Certificate in Agriculture," and (2) "Diploma in Agriculture."

V. That to pass for the "First-Class Certificate," a candidate must be acquainted with the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping; and that a certificate in the following terms, bearing the corporate seal and arms of the Society, signed by the President or Vice-President of the Council on Education and by the Secretary, shall be granted to candidates passing this Examination:—

"These are to certify that on the , A. B. was examined, and has been found to possess a knowledge of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping."

VI. That to pass for the "Diploma," a candidate must possess a *thorough knowledge* of the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping; and that a diploma in the following terms, bearing the corporate seal and arms of the Society, and signed by the President or Vice-President of the Council on Education and by the Secretary, shall be granted to candidates passing this Examination:—

"These are to certify that on the , A. B. was examined, and has been found to be proficient in the science and practice of agriculture, botany, chemistry, natural history, veterinary science, field-engineering, and book-keeping."

VII. That each successful candidate for the Society's Agricultural Diploma shall thereby become eligible to be elected a free life member of the Society.

VIII. That a Standing Acting Committee of the Council on Agricultural Education shall be appointed by the Directors.

Entrance Fee.—A fee of £1 is charged for admission to the Examination, this fee to be returned to those who obtain the Diploma at the particular Examination for which the fee is paid.

Note.—The names of Diploma Free Life Members will be found in the list of Members of the Society.

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[1] The Examinations will be held in 1899 on the 12th, 13th, and 14th April.

The list of those who, up till 1893, had obtained the First-Class Certificate appears in vol. v., fifth series (1893), of the 'Transactions.' The following have since obtained

FIRST-CLASS CERTIFICATES.

1894. David Blair, Bankfoot, Inverkip.
1894. B. R. S. Prichard, Brislington, Bristol.
1895. Wm. Cook Brackenridge, Agricultural College, Aspatria.
1895. David Dickinson, do. do.
1895. John Luker, do. do.
1895. David Donald, Whiteinch.
1895. F. J. Walkington, Greythorn, Kingstown.
1895. Sydney Edwards Pougnet, Edinburgh.
1896. J. I. Steel, 54 Cecil Street, Carlisle.
1896. James Wood, Grammar School, Darlington.
1897. John F. Blackshaw, Holly Bank, Marton, Chelford.
1897. David S. Bell, Auchtertyre, Coupar-Angus.
1897. Harold G. Brown, 7 Hughenden Terrace, Glasgow, W.
1897. William Bruce, Tullo of Benholm, Johnshaven.
1897. John Camplin, Agricultural College, Aspatria.
1897. William Edwards, 242 Nantwich Road, Crewe.
1897. Arthur C. Oldman, Agricultural College, Aspatria.
1897. John C. Rushton, Hilderstone, Stone, Staffs.
1897. Arthur Wm. Sheldon, Agricultural College, Aspatria.
1897. J. Grant Smith, Inverallan, Grantown, N B.
1897. William Taylor, Ninebanks, Allendale, Northumberland.
1897. Wm. Montgomery Tod, 11 Carlyle Road, Cambridge.
1898. Joseph Appleby, Agricultural College, Aspatria.
1898. William H. Bebbington, Agricultural and Horticultural School, Holmes Chapel.
1898. Arthur F. Borthwick, Lucklaw Hill, Leuchars.
1898. Bernard W. Bull, Holmes Chapel.
1898. James Thomson Cole, Fell Court, Torquay, Devon.
1898. William Galloway, Wamphorflatt, Lanark.
1898. Wm. Septimus Harrison, Agricultural College, Aspatria.
1898. Matthew H. Howie, Clachan Farm, Roseneath.
1898. W. C. Jardine, 140 Mains St., Blythswood Square, Glasgow.
1898. Arthur P. Ker, Agricultural College, Aspatria.
1898. Thomas Newton, Holmes Chapel.
1898. James Pimlott, do.
1898. William Reynolds, do.
1898. Fred Smith, do.
1898. Bernard N. Wale, Burton Bandalls, Loughborough.

SYLLABUS OF EXAMINATION

FOR DIPLOMA AND CERTIFICATE.

I.—SCIENCE AND PRACTICE OF AGRICULTURE.

1. *Geology.*—Geological strata—surface geology—formation of soils—their classification—physical characters and composition—suitability for cultivation.

2. *Drainage, &c.*—The principles on which drainage, irrigation, and warping operations should be based and carried out.

3. *Top-dressing.*—The application of lime—marl—clay, &c.

4. *Rotations.*—The principle of rotations—rotations suitable for different soils—systems of farming.

5. *Manures.* — The composition of manures — general and special—amounts used per acre—period and mode of application.

6. *Food-stuffs.*—The composition of feeding substances—their suitability for different classes of farm stock—considerations affecting their use.

7. *Crops.*—"How crops grow"—our farm crops—their cultivation, including cleaning, harvesting, and storage—diseases—insect injuries and remedies. The formation and management of plantations.

8. *Ensilage.* — Sweet and sour silage — different forms of silos and systems of ensilage.

9. *Weather.*—Meteorology, or the laws of climate as affecting plant-life—the influence of light and heat on cultivation—of absorption and retention of heat and moisture—of porosity and capillarity in soils.

10. *Live Stock.*—The breeding, rearing, feeding, and general treatment of farm stock—the different breeds of horses, cattle, sheep, and pigs—their characteristics—the districts where they are generally met with.

11. *Machinery.*—The machines and implements used in farming—their uses, prices, and the principal points to be attended to in their construction.

12. *Mechanical Powers.*—The "prime movers," or sources of power used in agriculture: man—horse—wind—water—steam—their relative values and advantages.

13. *Farming Capital.*—Calculations of the cost of stocking and working arable, stock, and dairy farms.

Text-books.—Stephens' 'Book of the Farm,' William Blackwood & Sons, Edinburgh and London; Pringle's 'Live Stock of the Farm,' William Blackwood & Sons; Wallace's 'Farm Live Stock of Great Britain,' Crosby Lockwood & Son; M'Connell's 'Agricultural Facts and Figures,' Crosby Lockwood & Son; 'Our Farm Crops,' Blackie & Son; 'How Crops Grow,' Macmillan & Co.; Warington's 'Chemistry of the Farm,' Vinton & Co., Limited, London; Aikman's 'Manures and Manuring,' William Blackwood & Sons; M'Alpine's 'Grasses'; Geikie's 'Outlines of Geology.'

II.—BOTANY.

1. *Nutritive Organs of Plants.*—Root, stem, leaves. Functions of roots. Various kinds of stem, with examples. Use of the stem. Structure of leaves. Different kinds of leaves. Arrangement and functions of leaves.

2. *Reproductive Organs.*—Flower and its parts. Arrangements of the whorls of the flower—calyx, corolla, stamens, pistil. Ovule. Mature pistil or fruit. Pruning and grafting. Seed. Young plant or embryo. Sprouting of the seed, or germination.

3. *General Principles of Classification.*—Meaning of the terms Class, Order, Genus, and Species. Illustrations of natural orders taken from plants used in agriculture, such as grain crops, grasses, clovers, vetches, turnips, mangel-wurzel, peas, beans, &c. Practical examination in fresh specimens and models; some of the latter may be seen in the Museum at the Royal Botanic Garden, which is open daily to the public, free

Text-book.—Balfour's 'Elements of Botany,' A. & C. Black.

III.—CHEMISTRY AND PHYSICS.

Physics.

Matter.—Essential properties. Measurement of mass and capacity—decimal system. Solids, general properties. Liquids—capillarity, osmosis, hydrostatic law. Gases—density, diffusion, barometer, Boyle's law, Charles's law.

Energy.

Transformation and conservation of energy. Heat—temperature, thermometer, conduction, convection, radiation, mechanical equivalent of heat. Light—refraction, polarisation, the spectrum.

Chemistry.

Processes—solution, filtration, sublimation, distillation, crystallisation, dialysis. Fundamental laws—constant proportion, multiple proportion, Avogadro's law, periodic law. Classification of the elements—characteristics of the commoner elements. Water—natural waters, their common impurities, soft and hard waters, water storage, water purification, composition, analysis, hydrates, steam, latent heat of water and steam. Hydrogen. Oxygen, oxides. Acids, bases, salts. Nitrogen, ammonia, nitric acid, nitrates and nitrites. The atmosphere—relation to animal and vegetable life. Chlorine—hydrochloric acid, chlorides, hypochlorites, bleaching-powder, bleaching, disinfection, chlorates. Bromine, iodine, and fluorine, and their chief compounds. Sulphur, sulphuretted hydrogen, sulphuric acid and sulphates, sulphurous acid, sulphites, and thiosulphates. Phosphorus, oxides of phosphorus, phosphates. Borates and silicates. Carbon, its oxides, carbonates, carbon disulphide. Hydrocarbons, chloroform, alcohols, ether, aldehyde, amines and amides, formic, acetic, oxalic, lactic, tartaric, and citric acids and their commonest salts. Glycerol, saponification. Distillation of wood and coal. Benzene, anilin, carbolic acid, benzoic acid, turpentine. Hydrocyanic acid, cyanides, cyanates. Urea, uric and hippuric acids.

The following metals, their ores, metallurgy, oxides, and more important salts—potassium, sodium, barium, calcium, magnesium, aluminium, zinc, manganese, iron, chromium, bismuth, antimony, arsenic, lead, copper, mercury, silver, tin, platinum.

The chief tests for these metals and for the following acids—sulphuric, sulphurous, phosphoric, carbonic, hydrochloric, nitric, acetic, and oxalic. Alkaloids, morphin, quinin, strychnin.

IV.—AGRICULTURAL CHEMISTRY.

1. *Soils.*—Their origin, formation, and classification. The physical and chemical properties of soils, and their improvement by physical and chemical means—their relation to air and water. Nitrification and the biology of the soil.

2. *Plants.*—The mineral and organic constituents of plants. The substances required for plant nutrition, and their relative importance. The chemical processes occurring in the germination, growth, and maturation of plants. Albuminoids, amides, and amido acids. Carbohydrates—sugars, starch, cellulose, pentoses. Fermentations—alcoholic, acetic, lactic, and butyric. Plant decay.

3. *Manures.*—Farmyard manure—its composition, improvement, and conservation. Fertilisers—their classification, composition, uses, and abuses—their mutual compatibility—their suitability for different crops and for different soils. The investigation and analysis of fertilisers, and their valuation and economic application. The conducting of manurial experiments.

4. *Crops.*—The chemical composition of the more important crops, and their mutual relations. The science of rotations. Symbiosis.

5. *Fodders.*—The general composition of the different classes of fodder crops. The circumstances affecting the nutritive value and digestibility of fodders. The injuries and impurities to which they are liable. The analysis and investigation of fodders. The detection of impurities in concentrated fodders.

6. *Animal Nutrition.*—The main facts regarding respiration and digestion. The production of flesh, fat, and bone. The nutrient ratio as a guide in stock-feeding. The calculation of dietaries. The relation of food to the age, condition, and progress of stock, and also to work. The conducting of feeding experiments.

7. *Dairy Produce.*—The chemical composition of milk. The testing and analysis of milk. The circumstances affecting milk production. Milk preservation. The composition of butter and cheese, and the chemical and physical conditions requisite for the production of butter and cheese of good quality. The sophistications of dairy produce and their detection. The diseases of milk and cheese, and the means of preventing their occurrence. The general scientific conduct of the dairy.

8. *The Relation of Food to Manure.*—The quality of manure derived from different kinds of stock, according to age, use, and feeding. Circumstances affecting the value of manures derived from feeding. The estimation of unexhausted fertility under different systems of feeding, manuring, and cropping.

Text-books.—Roscoe's 'Lessons in Elementary Chemistry,' Macmillan & Co., London, price 4s. 6d.; Johnston and Cameron's 'Elements of Agricultural Chemistry and Geology,' William Blackwood & Sons; Johnston's 'How Crops Grow,' Macmillan & Co., London; Warington's 'Chemistry of the Farm,' Vinton & Co., Limited, London.

V.—NATURAL HISTORY.

1. ZOOLOGY.

1. The characters distinguishing the primary divisions of the Animal Kingdom.

2. A general knowledge of British Mammals, Birds, and Fresh-water Fishes. A more special knowledge of the natural history of the domestic animals and their parasites.

3. The classification of insects, and a knowledge of those which are injurious to crops.

Text-book.—Nicholson's 'Introductory Text-Book of Zoology,' William Blackwood & Sons, Edinburgh and London.

2. GEOLOGY.

1. A general knowledge of the chemical composition and physical characters of the rock-forming minerals, and of the composition and mode of occurrence of the common rocks. The changes in rocks and minerals induced by weathering.

2. The terms (Dip, Strike, &c.) used in descriptive field Geology.

3. A general knowledge of the great geological formations, with their characteristic fossils.

4. The geological sources of the leading economic mineral products.

5. Influence of the geological structure of a country on the configuration of the land and the composition of the soil.

Text-books.—Page's 'Introductory Text-Book of Geology' and Lyell's 'Students' Elements of Geology.'

VI.—VETERINARY SCIENCE

1. Anatomy of the digestive organs of horse, ox, and sheep, including their structural differences.

2. The digestive processes and principles of nutrition in the above animals.

3. A general knowledge of the blood and its circulation, and the processes of respiration, secretion, and excretion.

4. The physiology of reproduction, and its bearings on healthy breeding.

5. The period of utero-gestation in the mare, cow, ewe, and sow, and the special management of these animals prior to, at the time of, and after parturition

6. The feeding and general management of farm stock.

7. Their more common diseases, with the general principles of treatment.

Text-books.—'Youatt on Sheep,' price 7s. 6d.; Steel's 'Diseases of the Ox,' price 15s.; Williams's 'Principles and Practice of Veterinary Surgery,' price 30s.; Williams's 'Principles and Practice of Veterinary Medicine,' price 30s.

VII.—FIELD-ENGINEERING.

1. Land-surveying with the chain.

2. Mensuration of areas of land, in imperial and Scotch acres, from a chain survey or from a plan.

3. Levelling with the ordinary levelling instrument and staff, and calculating levels and gradients

Text-book.—'Rudimentary Treatise on Land and Engineering Surveying,' by T. Baker, C.E., Weale's Series, price 2s. Part i. chaps. 1, 2, 3, and 6, and part ii. chap. 1, to be read.

VIII.—BOOK-KEEPING.

1. Questions in Practice and Proportion.

2. Book-keeping—Describe books to be kept; give examples—taking of stock.

Text-book.—Stephens' 'Practical System of Farm Book-keeping,' William Blackwood & Sons, Edinburgh, price 2s. 6d.

EXAMINATION PAPERS, 1898

AGRICULTURE.

1. On a farm of 200 acres of good arable land, within three miles of a manufacturing town, a dairy of 50 Cumberland shorthorn cows is kept to produce milk for immediate consumption, and full advantage is taken of the local market for farm produce of all descriptions. State (1) what system of farming should be adopted, (2) how you would feed and manage the cows, (3) the amount of produce of different kinds you would expect from the farm, (4) how you would dispose of it, and at what prices. After showing how the fertility of the land may be maintained, and stating the rent and taxes per acre, show roughly what profit should be got per annum from the holding.

2. Write a short paper on the advantages of green manuring, and explain how leguminous plants are superior to other plants for this purpose.

3. Write a short paper on the utilisation of steam as a motive power on the farm. Explain for what purposes it is suitable. State its cost for tillage purposes as compared with horse power, and point out the advantages and the disadvantages of steam tillage.

4. Give an account of "the potato disease," its nature, progress, and effects, and state what can be done to prevent or diminish its ravages.

5. Take a 500-acre farm on which 60 acres of turnips yielding 30 tons per acre are annually grown; state how many bullocks—each bullock to be 9 cwt. live weight when bought in on 1st October—you would expect to fatten in the course of the winter on these turnips along with straw or hay and cake. State what weight of roots, fodder, and cake each bullock would require per week. State what price per live weight cwt. you would expect to buy the store bullocks at in the autumn, and what price per live weight cwt. you would expect to sell them at in the spring. Estimate the value of the roots, straw, and cake, and make up a profit and loss account on the transaction.

6. Take a farm of 500 acres of good arable loamy soil, rented at 30s. per acre—the farm to be three miles from a railway station and six miles from a market town. Assume that you have full freedom of cultivation and free sale of produce. State what system of cultivation you would follow in such a case, what acreage you would have under the different crops per annum, what artificial manures you would apply to the different crops, and what yield per acre of these crops you would expect to have. Also state how many horses and ploughmen you would require for the system of cultivation you describe, and what you would expect your labour bill to be in the course of the year.

7. Explain shortly the comparative advantages and disadvantages of applying dung (1) in autumn or winter on the surface before ploughing, and (2) in spring in drills. State the number and distance apart of heaps which should be drawn from each cart of dung when applying thirty-two carts per acre on stubble, and twenty-four carts per acre in drills—five drills being dunged simultaneously. On latter basis, and assuming the dung to be stored in the fields under cultivation, state the number of horses and labourers necessary to drill, dung, spread, and cover about 4 imperial acres per day, and how you would employ them.

8. Explain shortly the comparative advantages of (1) manual reapers and (2) binders. State whether in good weather manual or binder cut sheaves would be first ready for leading, and which would suffer most in stook in bad weather. State also the number of hands necessary to attend each, and the relative cost per acre (exclusive of horse-power) of cutting, binding, and stooking an average crop of grain in each case.

(*Three hours allowed.*)

BOTANY.

1. Classify (*a*) mangel, (*b*) parsley.

2. How would you distinguish any three of the six named grasses, in flower, and in absence of flower?—

Perennial ryegrass (*Lolium perenne*).
Meadow fescue (*Festuca pratensis*).
Couch-grass (*Triticum repens*).

Tufted hair-grass (*Aira cæspitosa*).
False oat (*Avena elatior*).
Rough-stalked meadow-grass (*Poa trivialis*).

3. State the *essential* and *external* conditions for the discharge of the functions of a green leaf.

4. What is a biennial plant? Specify and explain the peculiarities presented by the roots of biennials.

5. Describe the specimen.

(*An hour and a half allowed.*)

CHEMISTRY AND PHYSICS.

1. Explain Boyle's Law.

2. Show by means of examples the difference between Potential Energy and Kinetic Energy.

3. Describe what takes place when a solution of Caustic Potash is added to aqueous solutions of the following salts: silver nitrate, lead acetate, ferric chloride, ammonium carbonate.

4. What are the chief products of the distillation of wood? How would you separate them?

AGRICULTURAL CHEMISTRY.

1. What is the composition of Felspar? What are the products of its natural decomposition?

2. Describe the chemical changes that occur in barley during the process of malting.

3. How would you test for Phosphate, Potash, and Ammonia in a manure?

4. What is the chemical difference between grape sugar and cane sugar? By what chemical tests are they distinguishable?

(*Two hours allowed.*)

NATURAL HISTORY.

(*Only three questions in each subject to be answered.*)

ZOOLOGY.

1. Discuss the agricultural importance of earthworms.

2. Give a short account of the life-history of *two* of the following animals: liver-fluke, blow-fly or bluebottle, eel, frog.

3. Mention the period of gestation in the following mammals: mare, cow, sheep, and pig. How is the embryo in any one of these nourished during development?

4. State what you know of the structure, habits, and economic importance of the mole. How does a mole essentially differ from a rabbit or a stoat?

Geology.

1. Give a short account of the formation of coal; and mention *any three* Vertebrate fossils which might be found in Carboniferous rocks.

2. Explain *any two* of the following:—

(*a*) Crag-and-tail.
(*b*) False-bedding.
(*c*) A raised beach.
(*d*) Boulder-clay.

3. Give a short account of the Eocene Vertebrates, and point out how Eocene Ungulates differ from recent forms.

4. Mention the characteristic plants of the Cretaceous Period.

(*An hour and a half allowed.*)

VETERINARY SURGERY.

1. Describe briefly the process of Rumination.

2. What is the difference between venous and arterial blood? State what change is necessary for the conversion of the former into the latter.

3. If your neighbour's stock is affected with Foot-and-Mouth Disease, what precautionary measures would you adopt to prevent the spread of the disease to yours?

4. What is the mode of attachment of the placental membranes to the uterus of the cow? How soon after calving should they be expelled; and what may occur if they are unduly retained?

5. What is "Strangles"? What animals are usually affected by it? What are the symptoms in a typical case? How would you deal with an outbreak among colts at grass?

6. With regard to splints in horses, state what the causes are that generally give rise to them, their most common site, and the character of the lameness that they produce.

(*An hour and a half allowed.*)

MENSURATION AND FIELD-ENGINEERING.

Note.—Candidates must work out the questions on sheets of paper which will be supplied to them, which sheets must bear the Candidate's number, and be lodged, along with this examination paper, with the Secretary. The answers to the questions, excepting Nos. 2, 4, and 6, are also to be filled in on this paper.

Note of Imperial Measure.

10,000 square links = 1 square chain.
625 do. = 0·0625 do. = 1 pole.
25,000 do. = 2·5 do. = 40 poles = 1 rood.
100,000 do. = 10 do. = 160 do. = 4 roods = 1 acre.

The imperial is to the Scotch acre as 1 : 1·261 nearly.

1. Find the area of a rectangular field A B C D. Give the answer in acres and decimals; and also in acres, roods, and poles.

2. From the following notes in a Survey Book make sketch-plan, and find the contents or area, of a field in acres and decimals.

Perpendiculars or offsets on left.	Base line to ⊙ C.	Perpendiculars or offsets on right.
	2200	
	1500	D=740
B=520 links.	1000 links	
Begin at	point ⊙ A and	range East.

3. The contents of a piece of land being 650 Scotch acres, give the area in imperial acres and decimals.

4. Divide the right-angled triangular field A B C among three persons whose ownership is worth £25, £55, and £70 respectively, so that each may have use of water at the point C. Give the areas belonging to each in acres and decimals (to three places), and the length of each person's boundary on the line A B.

5. Measure by scale, and mark in links on the paper the measurements necessary to calculate the area of the field A B C D; also give the area in acres, roods, and poles.

6. Write down, as if in a level-book, the staff-readings in feet and decimals shown; reduce them, beginning at A, and give the difference between the water-levels of two ponds A and B, and also the height of the intervening points C, D, E, F above datum.

(An hour and a half allowed.)

ARITHMETIC AND BOOK-KEEPING.

1. If 36 men working 8 hours a-day for 16 days can dig a trench 72 yards long, 18 wide, and 12 deep, in how many days, working 12 hours a-day, will 32 men dig a trench 64 yards long, 27 wide, and 18 deep?

2. A person rents a piece of land for £120 a-year. He lays out £625 in buying 50 bullocks. At the end of the year he sells them, having expended £12, 10s. on labour. How much per head must he gain by them to realise his rent and expenses and 10 per cent on his original outlay?

3. A merchant imports goods, paying 3 per cent on the cost price for freight and duty. He sells to the retailer at 15 per cent profit on his whole outlay; the retailer sells at 25 per cent profit. What is the cost price of goods which are sold to the consumer for £2369?

4. Find by Practice the cost of 6 cwt. 2 qrs. 21 lb. 8 oz. at £5, 16s. 8d. per cwt.

5. Divide £858, 6s. 8d. among five persons in such a way that the first may have twice as much as the second, the second thrice as much as the third, the third four times as much as the fourth, and the fourth five times as much as the fifth.

6. If a square field 210 yards long cost 27s. to plough, what will a square field 350 yards long cost to plough?

7. Name the different books that ought to be kept by a farmer, and describe how these ought to be brought to a close.

8. The following are the Receipts and Payments by James Thomson, farmer at Braehead Farm, for crop and year ending 1st October 1897, Frame a Branched Account of Charge and Discharge :—

1896.					
Oct.	1.	Balance on hand	£30	10	6
"	26.	Paid for 3 sacks of oatmeal, at 25s. . .	3	15	0
Nov.	8.	" J. Smith for plough	6	0	0
"	11.	" Fire insurance premium . . .	8	17	6
"	15.	Received for wheat sold, and paid into bank .	276	1	4
"	22.	Drawn from bank, and paid farm-servants' half-year's wages	170	10	3
"	25.	Paid A. Breck, saddler, his account . .	6	0	0
Dec.	1.	Drawn from bank, and paid for cattle . .	350	0	0
"	"	Received for barley sold, and lodged in bank .	210	7	9
1897.					
Jan.	1.	Paid the following accounts—			
		Robert Armstrong, blacksmith	3	0	0
		Alexander Grant, mason	1	10	0
		Charles Ure, slater	5	6	0
"	26.	Drawn from bank, and paid half-year's rent .	250	0	0
Feb.	1.	Paid income-tax	12	19	7
"	16.	Drawn from bank, and paid John Orr for cake	15	0	0
Mar.	8.	Received for cattle sold, and paid into bank .	979	15	0
May	26.	Drawn from bank £185, 6s. 6d., and paid farm-servants' half-year's wages	150	6	6
"	28.	Paid for railway sleepers for fences . .	2	0	0
June	10.	" for turnip-seed	15	0	0
"	24.	Drawn from bank, and paid half-year's rent .	250	0	0
Aug.	31.	Received from shepherd for fallen mutton .	3	0	0
Sept.	30.	Drawn from bank, and paid harvest expenses .	90	0	0
"	"	Interest charged by bank on current account .	0	7	8

(*An hour and a half allowed.*)

VETERINARY DEPARTMENT

The Society established a Veterinary Department in 1823, but by an arrangement made with the Royal College of Veterinary Surgeons, the Society's examination ceased in 1881. Holders of the Society's Veterinary Certificate are entitled to become Members of the Royal College of Veterinary Surgeons on payment of certain fees, without being required to undergo any further examination. The number of Students who have passed for the Society's Certificate is 1183.

The Society votes annually twelve silver medals for Class Competition to each of the two Veterinary Colleges in Edinburgh, and to the one in Glasgow.

FORESTRY DEPARTMENT

The Society grants FIRST and SECOND CLASS CERTIFICATES in FORESTRY.

BOARD OF EXAMINERS.

Science of Forestry, Practical Management of Woods, and Forest Entomology.—COLONEL BAILEY, Lecturer on Forestry, Edinburgh University, 7 Drummond Place; Dr SOMERVILLE, Durham College of Science, Newcastle-on-Tyne; J. GRANT THOMSON, Grantown, Strathspey; D. F. MACKENZIE, Morton Hall, Liberton, Mid-Lothian; ANDREW SLATER, Osborne, Isle of Wight.

Forest Botany and Zoology.—Professor BAYLEY BALFOUR, A. N. M'ALPINE, and Dr R. S. M'DOUGALL.

Physics, Chemistry, and Meteorology.—Dr A. P. AITKEN, Dr WM. CRAIG.

Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to Fencing, Drainage, Bridging, and Road-making.—A. W. BELFRAGE, C.E., Edinburgh.

Book-keeping and Accounts.—WM. HOME COOK, C.A., Edinburgh.

Candidates must possess—1. A thorough acquaintance with the theory and practice of Forestry. 2. A general knowledge of the following branches of study, so far as these apply to Forestry: The Elements of Botany; The Elements of Physics, Chemistry, and Meteorology; Forest Entomology; Land and Timber Measuring and Surveying; Mechanics and Construction, as applied to fencing, draining, bridging, and road-making; Implements of Forestry; Book-keeping and Accounts.

The examinations[1] are open to candidates of any age, will be both written and oral, and will include such practical tests as may from time to time be found convenient to apply.

The maximum number of marks for each subject is 100; First-Class marks in all subjects 75, Second-Class marks in all subjects 50, Pass marks in all subjects 40.

To obtain the *First-Class Certificate* a Candidate must have First-Class s in Forestry and any two of the other subjects, and Pass in the

[1] The Examination will be held in 1899 on the 10th, 11th, and 14th April.

two remaining subjects. To obtain the *Second-Class Certificate* a Candidate must obtain Second-Class marks in Forestry and in any two of the other subjects, and Pass in the two remaining subjects.

If a Candidate has obtained First-Class marks in Forestry and failed in only one or two of the other subjects he can come up again for examination in these subjects alone for the *First-Class Certificate*, otherwise he must go through the entire examination again.

The following have obtained First-Class Certificates:—

George Young Wall, M.R.A.C., Durham,	1870
William Baillie, The Nurseries, Haddington,	1871
William Robertson, Forester's House, Lauder,	1871
Peter Loney, Marchmont, Duns,	1873
John M. Aitken, Norwood, Lockerbie,	1880
Richard Henderson, Portland Estates Office, Kilmarnock,	1880
A. H. Gibson, Kirkcaldy,	1882
Alex. Inglis, Westwood, Reston,	1882
Peter Reid, Port Ellen, Islay,	1884
John Hardie Wilson, D.Sc., F.R.S.E., St Andrews,	1884
Cecil Henry Hooper, M.R.A.C., Highlands Farm, Swanley, Kent,	1886
William Somerville, B.Sc., Prof. of Agriculture and Forestry, Durham College, Newcastle-on-Tyne,	1886
John Bardgett, 1 Gayfield Street, Edinburgh,	1887
Wilfred James Fleet, Estate Office, Thurlow, Suffolk,	1888
Arthur Charles Forbes, Bowood, Calne, Hants,	1888
A. J. Farquharson, Newtyle, Forfarshire,	1890
John C. Menzies, Bankhead, Duns,	1891
John F. Annand, Bruckley, Aberdeenshire,	1895
William Davidson, Aldbar, Brechin,	1895
Alexander Fraser, Earnside, Alves, Forres,	1896
Patrick Hugh Guthrie, 49 Cluny Gardens, Edinburgh,	1897
John H. Milne Home, Caldra, Duns,	1898

The following have obtained Second-Class Certificates:—

John M'Ewen, Yellow Cottage, Killin,	1880
Thomas Berwick, 56 North Street, St Andrews,	1885
Donald C. Cameron Grant, Southleigh, Murrayfield,	1886
John A. Sawyer, Horningsham, Warminster, Wilts,	1891
H. W. Tucker, Blackheath,	1893
H. S Daine, Woolfall Hall Farm, Huyton, Liverpool,	1894
John Maughan, Jervaulx Abbey, Bedale,	1894
Eric Arthur Nobbs, Edinburgh,	1894
John James Simpson, The Gardens, Wortley, near Sheffield,	1894
J. W. Paterson, 60 John Street, Glasgow,	1895
Hugh W. Stone, Carlton Lodge, Tunbridge Wells,	1895
Andrew Linton, Oakwood, Selkirk,	1896
Fred. Wakerley, Durham College of Science, Newcastle-on-Tyne	1896
Charles E. Legat, 16 Cluny Drive, Edinburgh,	1897
Donald M'Lean, jun , Rhives, Golspie, N.B.,	1897
William Taylor, Ninebanks, Allendale, Northumberland,	1897
Charles W. Watson, Summer Hill, Kendal	1897
Fraser Story, The Glen, Innerleithen,	1898
Daniel Robb, South Palmerstone Farm, Ochiltree,	1898
John O. Peet, Edinburgh,	1898

SYLLABUS OF EXAMINATION

I.—SCIENCE OF FORESTRY AND PRACTICAL MANAGEMENT OF WOODS.

I. *Principles of Scientific Forestry.*—1. Effects of heat, light, moisture, and air-currents on forest vegetation. 2 Effects of depth, porosity, moisture, and chemical composition of the soil on forest vegetation. 3. Effects of forest vegetation on the soil and air. 4. Rate and extent of development, longevity, and reproductive power of trees. 5. Pure and mixed woods. 6. Systems of sylviculture.

II. *Practical Management of Woods.*—7. Draining and irrigation. 8. Choice of species for various situations. 9. Seed and sowing, including nurseries. 10. Planting. 11. Natural regeneration by seed, shoots, and suckers. 12. Formation of mixed woods. 13. Tending of young woods. 14. Pruning. 15. Thinning. 16. Sylvicultural characteristics of the principal trees.

III. *Injuries by Storms and Fires.*—17. Storms. 18. Fires.

IV. *Timber.*—19. Its technical properties. 20. Its defects. 21. Recognition of different kinds of timber. 22. Processes for increasing its durability.

V. *Utilisation of Produce.*—23. Uses of wood and other produce. 24. Felling. 25. Conversion. 26. Seasoning 27. Transport. 28. Sales. 29. Harvesting of bark.

VI. *Forest Organisation.*—30. General ideas regarding a regulated system of forest management.

Books recommended.—Schlich's 'Manual of Forestry'; Nisbet's 'British Forest Trees'; Nisbet's 'Studies in Forestry'; Furst's 'Protection of Woodlands,' translated by Nisbet; Hough's 'Elements of Forestry'; Brown's 'Forester' (latest edition); Laslett's 'Timber and Timber Trees.'

II.—FOREST BOTANY AND FOREST ZOOLOGY.

(a) FOREST BOTANY.

The fundamental facts of morphology, physiology, and classification of plants. The structure and function of the plant-cell and the plant-tissues. Their primary distribution. The secondary changes they exhibit in consequence of perennation.

The structure and function of the root and shoot in flowering-plants. Buds, their forms and uses. The flower. The fruit. The seed.

The structure and function of vegetative and reproductive organs of fungi.

Relationship of plants to air, soil, and water. Effect of light, heat, and mechanical agencies upon plants. Nutrition. The nature and elements of the food of plants. Sources of plant-food. The absorption, elaboration, transference, and storage of food. Respiration and transpiration. Parasites and saprophytes. Symbiosis.

Growth of plants in length and thickness. Correlation of growth, pruning. Germination of seeds. Formation of wood and bark. Healing of wounds.

Diseases of plants due to faulty nutrition and unfavourable circumstances of growth. Diseases due to attacks of fungi.

Natural reproduction and propagation by seeds and by buds. Fertilisation of flowers. Hybridisation. Artificial propagation by budding, grafting, layering, and cutting.

The characters of the large groups and classes of the vegetable kingdom. The characters of the families of plants which include the chief timber trees. The botanical characteristics of the principal British forest-trees (including the structural features of their wood). The weeds of the forest and their significance.

Books recommended.—Scott, 'Structural Botany'; Prantl and Vines, 'Text-Book of Botany'; Marshall Ward, 'Timber and some of its Diseases'; Marshall Ward, 'Diseases of Plants'; Marshall Ward, 'The Oak'; Schlich's 'Manual of Forestry,' vol. ii., Appendix to chapter iv., by Marshall Ward; Hartig, 'Timbers, and how to know them,' translated by Somerville; Hartig, 'Anatomy and Physiology of Plants,' translated by Nisbet; Hartig, 'Diseases of Plants,' translated by Marshall Ward and Somerville; Warming, 'Handbook of Systematic Botany,' translated by Potter; Bower, 'Practical Botany for Beginners'

(*b*) FOREST ZOOLOGY.

The group Insecta. its position in the animal kingdom. Structure, mode of reproduction, and metamorphosis of insects. The outlines of classification of the group. Conditions favourable to the numerical increase of insects. Natural checks to increase (*e.g.*, birds, mammals, parasitic insects). The identification and life-history of the more important insects injurious to forest-trees and fruit-trees. The damage caused by these insect pests and their mode of attack. The damage caused by animals. Preventive and remedial measures.

Books recommended—Ormerod, 'Manual of Injurious Insects'; Fürst, 'Protection of Woodlands,' translated by Nisbet, various articles in 'Transactions' of Highland and Agricultural Society and of Royal Scottish Arboricultural Society.

III.—PHYSICS, CHEMISTRY, AND METEOROLOGY.

Physics.

Mass, weight, specific gravity, solid, liquid, and gaseous states of matter. Capillarity, osmose, vapour tension, suction pump, force pump, syphon, barometer, atmospheric pressure. Boyle's law. Levers and pulleys. Heat, measurement of heat, specific heat; transference of heat by conduction, convection, and radiation. Boiling and freezing. Latent heat. The thermometer. The conservation and transformation of energy. Light—reflection, refraction, polarisation; the spectrum. The rudiments of electricity and magnetism.

Chemistry.

Elements. Oxygen, hydrogen, nitrogen;—their preparation, properties, and chief compounds. Acids, bases, salts. Combustion, oxidation, reduction. Sulphur, Carbon, Phosphorus; and their compounds, with oxygen and hydrogen. Metals—potassium, sodium, calcium, magnesium, aluminium, iron, copper, lead, mercury, and their chief compounds. Carbohydrates, marsh gas, olefiant gas, alcohol, acetic acid, oxalic acid. Distillation of wood and coal.

Meteorology.

The atmosphere, its composition and physical properties. Measurement of pressure and temperature. The barometer. Rain, hail, snow, fog, cloud, dew, the dew point, hoar frost. The weathering of rocks and soils. Gases injurious to vegetation.

Books recommended.—'Elementary Physics,' Balfour Stewart; 'Lessons in Elementary Chemistry,' Roscoe; 'Introductory Text-Book of Meteorology,' Buchan.

IV.—LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, BRIDGING, AND ROAD-MAKING.

1. The use of the level and measuring-chain. Measuring and mapping surface areas. 2. The measurement of solid bodies—as timber, stacked bark, fagots, &c., earthwork. 3. The different modes of fencing and enclosing plantations; their relative advantages, durability, cost of construction, and repairs. 4. The setting out and formation of roads for temporary or permanent use. 5. The construction of bridges over streams and gullies; of gates or other entrances.

Books recommended.—'Agricultural Surveying,' by John Scott (Weale's Series); Hoppus's 'Tables'; 'Farm Roads, Fences, and Gates,' by John Scott (Weale's Series); Brown's 'Forester' (latest edition).

V.—BOOK-KEEPING AND ACCOUNTS.

1. Questions in Practice, Proportion, and Decimal Fractions. 2. Book-keeping—describe books to be kept; and best method of valuing timber. 3. Practical questions in Book-keeping will also be given.

Book recommended.—Brown's 'Forester' (latest edition).

EXAMINATION PAPERS, 1898

PRACTICAL FORESTRY.

1. A plantation almost square, 200 acres in extent, has to be formed on a hillside covered with herbage six inches in height, ten acres of which are wet. Describe how you would fence the ground with wire and larch posts, and cost per yard. Explain how you would drain the wet portion, and cost per chain. The plantation is to be composed of two-thirds Scots fir, one-third of spruce and larch. What is the best way to procure the plants, what size and age are best adapted for the ground, and what would be the price of each variety? Describe the method of planting, and indicate the best season of the year for the works being executed.

2. In regard to a nursery, explain the best ages of trees—Scots fir, spruce, larch, oak, and beech—from which to collect seed; the best season for collecting Scots fir cones; and the quantity of seed per bushel of cones.

3. A plantation 100 acres in extent, 70 years of age, with a crop of 400 trees (mostly Scots fir) to the acre, has been so severely injured by squirrels that it is thought advisable to clear the ground. Describe how you would mark and count the trees, and divide them into three lots. Give, by way of example, an imaginary classification of different sizes, and write out an advertisement for sale of above by private tender.

4. What are knots in timber, how are they formed, which trees produce them in greatest abundance, and how is their production influenced

by sylviculture? What is a loose knot? Show how the arrangement of the knots would at once enable you to distinguish planks of Scots fir and spruce.

5. Assuming you have 10 acres of land to plant, and that you set out the trees so that those in any one row come exactly opposite the centre of the intervals between the plants in the adjoining rows (the so-called triangular system), how many trees would you require to stock the ground, supposing the distance from plant to plant is 4 feet?

(*Two hours allowed.*)

FOREST BOTANY AND FOREST ENTOMOLOGY.

Candidates are expected to answer five of the questions—three from the Section of Forest Botany, and two from the Section of Forest Entomology.

(*a*) Forest Botany.

1. Write an account of the characters by which the Coniferæ are distinguished.

2. Describe the appearances presented by timber affected by dry-rot. Give an account of the life-history of the fungus causing the disease. What are the conditions favourable to the development of the disease? What are the best remedial and preventive measures?

3. Describe the process of transpiration in a broad-leaved tree under the headings—

(*a*) Mechanism involved;
(*b*) Period of performance;
(*c*) Conditions favourable and unfavourable;
(*d*) Necessity of the process to the plant.

4. What are cambium and callus? Where are they found in Forest trees? What are their uses, and how do they perform their work?

5. State what you know of the method in which fertilisation is performed in any British Forest trees. Describe the flower structure of the trees you refer to, and show how they are adapted fertilisation.

(*b*) Forest Entomology.

6. What are the characters of the Order Hymenoptera? Name two useful and two injurious forms belonging to the Order.

7. Give the life-history of the Cockchafer (*Melolontha vulgaris*). How is it harmful, and what measures, preventive and remedial, would you adopt against it?

8. What Insecticides would you employ against jawed (mandibulate) Insects and sucking (haustellate) Insects respectively?

(*Two hours allowed.*)

PHYSICS, CHEMISTRY, AND METEOROLOGY.

1. Explain what is meant by capillarity. How is the amount of moisture contained in a soil affected by capillarity?

2. Explain the use of the wet and dry bulb thermometer

3. How are the following substances made: quicklime, calcium bicarbonate, washing-soda, chlorine?

4. What is the composition of Acetic Acid? How is Acetic Acid made? What is its action on Oxide of Lead?

(*An hour and a half allowed.*)

LAND AND TIMBER MEASURING AND SURVEYING; MECHANICS AND CONSTRUCTION AS APPLIED TO FENCING, DRAINAGE, BRIDGING, AND ROAD-MAKING.

1. Draw sketch of best construction for wooden gate, giving materials used and cost.

2. A field has been drained at considerable expense with furrow drains, 18 feet apart, connected to main drains; but care, as to depth and inclination, has not been exercised in laying the drains, and they are not efficient. Describe the most economical method of remedying matters, and give sketch.

3. Give cross-section of culvert formed with concrete for conveying water in burn below road. Assume width of burn at 3 feet, and height of banks 3 feet. Describe proportions for concrete, and method of construction of culvert. The road is one on which a heavy road-roller may be used.

4. Give description, with cross-section, of the method of constructing a country road to be taken over by the authorities for public use.

5. Give a short specification for dry-stone dyking.

6. Describe the method of laying a pipe sewer, the materials employed, and the best means of testing it.

7. Calculate the cubic contents of a cutting 18 feet long, 9 feet wide at base, 8 feet average depth, and side slopes 1½ horizontal to 1 perpendicular.

(*Two hours allowed.*)

ARITHMETIC AND BOOK-KEEPING.

1. Find the value of $6{\cdot}45 - {\cdot}\dot{3} + 7{\cdot}\dot{7}\dot{2} - 6{\cdot}0\dot{4}\dot{5} + 309 - {\cdot}94\dot{7}2\dot{4}$.

2. Add together ·00125 ton, ·0125 cwt., ·025 lb., and express the result as the decimal of 2 qrs. 9 lb.

3. Find by Practice the cost of 22 qrs. 4 bush. 3 pks. of wheat at 5s. 8¼d. per bush.

4. If 15 men, 12 women, and 9 boys can complete a piece of work in 50 days, what time would 9 men, 15 women, and 18 boys take to do four times as much, the parts done by each in the same time being as the numbers 3, 2, and 1?

5. A beam 16 ft. long, 2¼ ft. broad, and 8 in. thick, weighs 1280 lb.; find the length of another beam of the same material, whose breadth is 3¼ ft., thickness 7½ in., and weight 2028 lb.

6. If 12 oxen and 35 sheep eat 12 tons 12 cwt. of hay in 8 days, how much will it cost per month (of 28 days) to feed 9 oxen and 12 sheep, the price of hay being 4 guineas a ton, and 3 oxen being supposed to eat as much as 7 sheep?

7. Describe briefly the books a forester ought to keep, and their nature and use.

8. The following are the transactions in connection with Eastdale Woods, for the month of April 1897, as taken from the Head Foresters' Notebook. From them write up the cash-book, and show the ledger entries for the receipts and payments. All payments are made by cheque, and all receipts are lodged in bank :—

April	1.	Balance in bank	£540	0	0
"	3.	Received from D. Mackinnon to account of £600, due for larch timber sold to him . .	400	0	0
"	6.	Received from J. Ford in settlement of price of pine timber sold to him.	315	0	0
"	"	Allowed him discount	9	0	0
"	7.	Paid J. Grant for young trees for nursery—			
		Cash	73	0	0
		Discount.	3	0	0
"	11.	Paid W. Scott, carriage on do.	3	0	0
"	17.	" C. Bernard, assessor, amount of assessments	13	14	0
"	27.	" W. Johnston, for repairs to lodge . .	54	3	4
"	30.	Received from T. Smith & Sons, one month's rent of sawmills	10	0	0
"	"	Pay-list for month.	167	0	0
"	"	Paid J. White, forester, one month's salary .	25	0	0
"	"	" T. Bell, assistant, do. do. .	8	6	8
"	"	Remitted Lord Newton	500	0	0

(*An hour and a half allowed.*)

DAIRY DEPARTMENT

EXAMINATION IN THE SCIENCE AND PRACTICE OF DAIRYING

This Examination, instituted in 1897, is conducted jointly by the Royal Agricultural Society of England and the Highland and Agricultural Society of Scotland.

REGULATIONS.

1. The Societies may hold annually in England and in Scotland one or more Examinations for the National Diploma in the Science and Practice of Dairying; the Diploma to be distinguished shortly by the letters "N.D.D."

2. The Examinations will be held on dates and at places from time to time appointed and duly announced.

3. A deposit of £1 will be required from each candidate, which deposit will be returned to those who succeed in obtaining the Diploma. The Societies may, at their discretion, allow the deposit paid by an unsuccessful candidate to be used for one subsequent Examination for the Diploma.

4. Forms of Entry for the Examination in England may be obtained of the Secretary of the Royal Agricultural Society of England, 13 Hanover Square, London, W.

5. Forms of Entry for the Examination in Scotland may be obtained from the Secretary of the Highland and Agricultural Society of Scotland, 3 George IV. Bridge, Edinburgh.

6. A candidate may enter for the Examination either in England or Scotland, but not in both; and a candidate who has once taken part in an Examination in England cannot enter for an Examination in Scotland, or *vice versa*.

7. A candidate will be required to satisfy the Examiners, by means of written papers, practical work, and *vivâ voce*, that he or she has—

   (1) A thorough acquaintance, both practical and scientific, with everything connected with the management of a Dairy, and the manufacture of Butter and Cheese.

   (2) A general knowledge of the management of a Dairy Farm, including the rearing and feeding of Dairy Stock.

   (3) Practical skill in Dairying, to be tested by the making of Butter and Cheese.

   (4) Capacity for imparting instruction to others.

8. To qualify for admission to the Examination, a candidate must produce satisfactory evidence of having taken part in practical dairy work upon a farm for a period of not less than twelve months, three months of which may have been spent at a Dairy Institute.

9. The Societies reserve the right to postpone, abandon, or in any way, or at any time, modify an Examination, and also to decline at any stage to admit any particular candidate to the Examination.

By Order,

ERNEST CLARKE,
Secretary, Royal Agricultural Society of England,
13 Hanover Square, London, W.

JAMES MACDONALD,
Secretary, Highland and Agricultural Society of Scotland,
3 George IV. Bridge, Edinburgh.

SYLLABUS.

I. GENERAL MANAGEMENT OF A DAIRY FARM.

General Management of Pastures and Crops on a Dairy Farm.

Buildings.

Situation, surroundings, construction, ventilation, and drainage of farm buildings. Suitability of building materials. Water supply. Construction and arrangement of Dairies: (*a*) for general purposes, (*b*) for special purposes.

Foods and Feeding.

Summer and winter feeding of Dairy cattle. Root crops. Green fodder. Ensilage. Different kinds of food and their composition. Their effect upon milk, butter, and cheese. Special foods used in Dairy feeding. Preparation of food for Dairy stock. Rearing and feeding of young stock. Feeding and management of pigs and poultry.

Dairy Cattle in Health and Disease.

Characteristics of different breeds, and choice of Dairy cattle. General functions of the organs of the animal body. Breeding. Parturition. Organs which secrete milk. Process of milk secretion. Changes which food undergoes during digestion. Diseases of Dairy cattle and their remedies.

II. MANAGEMENT OF A DAIRY.

Milk and Cream.

Process of milking. Dairy utensils and appliances, hand and power. Cooling of milk. Separation and ripening of cream. Different systems of cream-raising. Utilisation of skim-milk. Keeping of milk. Importance of cleanliness. Diseases spread by milk. Conveyance and sale of milk. Milk records. Keeping of Dairy and farm accounts. Creameries. Butter and cheese factories. Different systems of Dairying and their comparative returns.

Butter.

Churns and other butter-making appliances, hand and power. Souring of cream. Churning. Washing and working of butter. Butter-milk. Packing and transmission of butter. Salting and keeping of butter. Colouring. Characteristics of good butter.

Cheese.

Principles of its manufacture. Making of different kinds of cheese (from cream, whole-milk, and skim-milk). Acidity of milk. Use of rennet and its substitutes. Whey. Appliances for cheese-making. Ripening and storage of cheese. Packing and sale of cheese. Making of cream and other soft cheeses.

III. CHEMISTRY AND BACTERIOLOGY.

Nature, composition, properties, and chemical constituents of milk. Microscopical appearances. The changes which take place in milk, and how produced. Circumstances affecting the quality and quantity of milk. Influence of temperature. Chemical changes involved in keeping and souring of milk, and in the formation of butter and cheese. Taints, fermentation, and putrefaction. The use of preservatives. Milk testing and analysis. Detection of adulteration in milk, cream, butter, and cheese.

Nature and functions of bacteria. The commoner forms of bacteria taking part in the operations of the Dairy.

IV. Practical Skill in Dairy Work.

Candidates must be prepared to show that they are able—(1) to milk cows, (2) to churn and make into butter a measured quantity of cream, and (3) to make one cheese of each of the following varieties: (i) hard-pressed, of not less than 30 lb., and (ii) veined, or blue-moulded, of not less than 10 lb., and also to make one or other of the following soft cheeses: Pont-l'Evêque, Jervais, Coulommiers, Camembert.

V. Capacity for Imparting Instruction to Others.

Candidates must also show practically that they are familiar with the management of a Dairy, and are capable of imparting instruction to others.

EXAMINATIONS IN 1899.

ENGLAND—Monday, September 25, to Friday, September 29, at Reading; last date for receiving applications, 31st August.

SCOTLAND—Monday, October 2, to Friday, October 6, at Kilmarnock; last date for receiving applications, 31st August.

The following obtained the Diploma in Scotland in 1898:—

Miss Sarah S. Anderson, Hosenette Farm, Stonehouse.
Miss Janet Campbell, 135 Wellington Street, Glasgow.
Miss Jeanie Carruthers, Netherton, Auchenheath, Hamilton.
Thomas Harrison, Gillings Creamery, Swindon, Wilts.
John Leslie, Kininvie, Mannofield, Aberdeen.
Wilson M'Master, Challoch, Dunragit.
John G. M'Millan, Fellnaw, Ringford.
John Marchbank, Devonburn, Lesmahagow.
Miss Isabella M. Montgomerie, Lessnessock, Ochiltree.
John O. Peet, Wimbrick Farm, Aughton, Ormskirk.
John Steven, jun., Purroch Farm, Hurlford, Kilmarnock.
Allan Stevenson, Parkhill, Craigie, Kilmarnock.
Miss Ellen Wright, Bruntwood Mains, Galston.

The following obtained the Diploma in England in 1898.—

Lawrence Abram, Glebe Lane, Banks, Southport.
Alex. Scott Cromar, Midland Dairy Institute, Kingston Fields, Derby.
C. W. Tisdale Davies, South-Eastern Agricultural College, Wye.
Miss S. B. J. Forrester, British Dairy Institute, Reading.
Samuel Fraser, Dairy Institute, Worleston.
Miss Eliza J. Freeman, Town Green, Aughton.
W. N. Platt, Rodway Farm, Wellington, Salop.
Arthur M. Smith, British Dairy Institute, Reading.
Miss Constance J. Sully, Dairy Institute, Worleston.
R. S. Thorne, British Dairy Institute, Reading.

EXAMINATION PAPERS

The following are the Papers for the Examination in Scotland in 1898:—

N.B.—*The answers are to be written upon one side only of the sheets supplied. The candidate is required to write his or her* NUMBER *upon each sheet at the right-hand top corner; to see that the sheets are paged consecutively in the centre at the top of each sheet; and at the close of the Examination to fasten the sheets together at the left-hand top corner, care being taken in so doing not to cover up the numbers of any questions answered.*

THE NAME OF THE CANDIDATE IS NOT TO BE WRITTEN UPON ANY OF THE SHEETS.

QUESTIONS IN GENERAL DAIRYING.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

(*Three hours allowed.*)

N.B.—*Nos.* 1, 2, *and* 3, *and at least other six questions, must be attempted.*

1. For a farm of 150 acres of medium soil give a rotation of crops suitable for carrying on and sustaining a dairy of 25 cows where a contract has been entered into to sell 50 imperial gallons of milk per day. Mention the district you have in view.

2. Construct one day's ration from food grown on above farm for each cow in full milk during October and also during February. Give your reasons fully.

3. Make out a statement showing approximate income, expenditure, and profit on above farm, and amount of capital required.

4. In walking over a farm that you proposed to take as a dairy farm, what indications would assist you in forming an idea of its value for this purpose?

5. Construct a daily time-table for the feeding and milking of a herd of dairy cows during winter, and state the amount and character of the foods you would recommend to give at the different times.

6. Describe a good system of ripening whole milk for butter-making. Compare the advantages and disadvantages of making butter (*a*) from ripened whole milk; (*b*) from ripened cream.

7. Specify the points you would allow when judging butter, and state how you would arrive at your awards.

8. What are the common diseases most easily conveyed to the human subject by milk, and how would you reduce the risk of conveying these diseases?

9. Describe the process of milking a cow. What are common errors in milking?

10. State fully a good method of cleaning and scalding dairy utensils, stating at what temperature the water should be for scalding the same. Give reasons for your answer.

11. State how you would feed and manage an Ayrshire heifer calf from birth till twelve months old, where milk commands a high price.

12. Describe the cause and symptoms of cow-pox, also the common method of spreading, and the treatment of this disease.

QUESTIONS IN CHEMISTRY AND BACTERIOLOGY.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

(Three hours allowed.)

1. What is the composition, and what are the characteristics, of caustic soda?

2. What is the action of caustic soda on each of the following substances?—

Sodium bicarbonate.
Ammonium sulphate.
Lactic acid.
Butter.

3. What are the chief mineral salts contained in milk, and what important purposes do they serve in dairy practice?

4. Distinguish between the processes of sterilising and pasteurising milk. How are these carried out, and in what circumstances are they of practical value?

5. Describe the characteristics of *Bacillus acidi lactis,* and explain how you would proceed to make a pure culture of it. What are the conditions and circumstances favourable to its growth?

6. Discuss the value of the Creamometer in dairy practice.

QUESTIONS IN CHEESE-MAKING.

MAXIMUM NUMBER OF MARKS, 200. PASS NUMBER, 100.

(Three hours allowed.)

1. State what utensils, with cost of each, would be required to make cheddar or Cheshire cheese in a dairy of 40 cows.

2. What temperature, in ordinary circumstances, should the evening's milk be in the morning before adding the morning's milking? What means would you take to ripen milk before adding the rennet? How would you test when milk is ready for renneting? What is the use of rennet in cheese-making? When does its action cease?

3. What amount of ripe cheese should be got from an average Ayrshire or Cross-bred cow per annum? What would be the difference in income per head per annum between selling milk at 5½d. per gallon and selling cheese at 53s. per cwt.? Give a clear statement and calculation showing this.

4. Describe fully the mode of making a cheddar or Cheshire cheese.

5. Describe a curing-room suitable for cheese from 40 cows. At what temperature should the curing-room be kept? If artificial heat is required, what are the best-known methods of applying it? Describe them.

6. Describe the character and detail the points of a fine cheddar or Cheshire cheese.

CHEMICAL DEPARTMENT

Chemist to the Society—Dr A. P. Aitken, Chemical Laboratory,
8 Clyde Street, Edinburgh.

The object of the Chemical Department is to promote the diffusion of a knowledge of Chemistry as applied to agriculture among the members of the Society, to carry out experiments for that purpose, to assist members who are engaged in making local experiments requiring the direction or services of a chemist, to direct members in regard to the use of manures and feeding-stuffs, to assist them to put the purchase of these substances under proper control, and in general to consider all matters coming under the Society's notice in connection with the Chemistry of Agriculture.

MEMBERS' PRIVILEGES IN RESPECT OF ANALYSES.

The fees of the Chemist for analyses made for members of the Society shall, until further notice, be as follows :—

The estimation of *one* ingredient in a manure or feeding-stuff, .	5s.
The estimation of *two* or *more* ingredients in do. .	10s.

These charges apply only to analyses made for agricultural purposes, and for the sole and private use of members of the Highland and Agricultural Society who are not engaged in the manufacture or sale of the substances analysed.

Valuations of manures, according to the Society's scale of units, will be supplied if requested.

MISCELLANEOUS.

	£	s.	d.
Analysis of water[1] to determine purity, hardness, and fitness for domestic use (not more than one analysis per year for any one member), ...	£1	0	0
Analysis of agricultural products—hay, grain, ensilage, roots, &c., ...	1	0	0
Limestone, giving the percentage of lime, . . .	0	5	0
Limestone, complete analysis, ...	1	0	0
Analysis of soil, to determine fertility and recommendation of manurial treatment, ...	2	0	0
Search for poisons in food or viscera, ...	2	0	0

Samples should be sent (carriage paid) to Dr A. P. Aitken, 8 Clyde Street, Edinburgh.

INSTRUCTIONS FOR SELECTING SAMPLES FOR ANALYSIS.

MANURES.

Four or more bags should be selected for sampling. Each bag is to be emptied out separately on a clean floor, worked through with the spade, and one spadeful taken out and set aside. The four or more spadefuls thus set aside are to be mixed together until a uniform mixture is obtained. Of this mixture one spadeful is to be taken, spread on paper, and still more thoroughly mixed, any lumps which it may contain being broken down with the hand. Of this mixture two samples of about half a pound each should be taken by the purchaser or his agent, in the presence of the seller or his agent or two witnesses (due notice having been given to the seller of the time and place of sampling), and these samples should be taken as quickly as possible, and put into bottles or tin cases to prevent loss of moisture, and having been labelled, should be sealed by the samplers—one or more samples to be retained by the purchaser, and one to be sent to the chemist for analysis.

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[1] Cases containing bottles for water samples and instructions for sampling are sent from the laboratory on application.

FEEDING-STUFFS.

Samples of feeding compounds should be taken in a similar manner.

Samples of cake should be taken by selecting three cakes, breaking each across the middle, and from the broken part breaking off a segment across the entire breadth of the cake. The three segments thus obtained should be wrapped up and sealed by the samplers, and sent for analysis as in the case of manures, and three duplicate segments similarly sealed and labelled should be retained by the purchaser.

SOILS.

Dig a little trench about two feet deep, exposing the soil and subsoil. Cut from the side of this trench horizontal scrapings of the soil down to the top of the subsoil. Catch these on a clean board, and collect in this manner about one pound weight of soil taken from the whole surface of the section. Similar scrapings of subsoil immediately below should be taken and preserved separately. Five or six similarly drawn samples should be taken from different parts of the field, and kept separate while being sent to the chemist, that he may examine them individually before mixing in the laboratory.

VEGETABLE PRODUCTS.

Turnips, &c., 40 bulbs carefully selected as of fair average growth.

Hay, straw, ensilage, &c., should be sampled from a thin section cut across the whole stack or silo, and carefully mixed about; about 2 lb. weight is required for analysis.

Grain should be sampled like manures.

DAIRY PRODUCE.

Milk.—Samples of milk from individual cows should be taken direct from the milk-pail. Average samples from a number of cows should be taken immediately after milking. Samples to be tested for adulteration should not be drawn from the bottom or taken from the top of standing milk, but they should be ladled from the vessel after the milk has been thoroughly mixed.

For most purposes a pint-bottle of milk is a large enough sample.

Butter and Cheese.—About quarter-pound samples are required.

WATERS.

When the water is from a well, it should be pumped for some minutes before taking the sample.

If the well has been standing unused for a long time, it should be pumped for some hours, so that the water may be renewed as far as possible.

If the well has been newly dug or cleaned out, it should be pumped as dry as possible, daily, for a week before taking the sample.

Water from cisterns, tanks, ponds, &c., should be sampled by immersing the bottle entirely under the water, and holding it, neck upwards, some inches below the surface. *Water from the surface should not be allowed to enter the bottle.*

Spring or stream water should not be sampled in very wet weather, but when the water is in ordinary condition. Such waters should be sampled by immersing the bottle, if possible; but if not deep enough for that purpose, a perfectly clean cup should be used for transferring the water to the bottle.

When the bottle has been filled the stopper should be rinsed in the water before replacing it.

Interference with or disturbance of wells or springs, or the ground in their immediate vicinity, must be carefully avoided during sampling, and for at least twenty-four hours before it.

After a sample has been taken, it should be sent to the laboratory as speedily as possible.

A description of the source and circumstances of the water should accompany the sample, as the interpretation of the analytical results depends to some extent on a knowledge of such particulars.

N.B.—Stone jars and old wine bottles are unsuitable for conveying samples. Winchester quarts chemically cleaned should be obtained from the laboratory here.

LOCAL ANALYTICAL ASSOCIATIONS.

With the view of encouraging, as well as regulating the conduct of, Local Analytical Associations, the Society, from 1881 to 1893, contributed from its funds towards their expenses a sum not exceeding £250 annually. In view of the passing of the Fertilisers and Feeding Stuffs Act, 1893, it was decided, at a meeting of the Directors on the 6th of December 1893, to discontinue that grant after the 1st of March 1894.

MANURES—THEIR COMPOSITION AND CHARACTERISTICS.

Nitrate of Soda.—A most valuable nitrogenous manure. Perfectly soluble, and immediately available for the nourishment of the plant. Feebly retained by the soil. Rapidly goes down to the subsoil. Benefits deeply-rooting plants. *When much nitrate of soda is frequently applied and unaccompanied by other manures, the soil becomes rapidly exhausted.*

Good samples contain 95 per cent or upwards of pure nitrate of soda, containing about 15½ per cent nitrogen.

Sulphate of Ammonia.—A more concentrated nitrogenous manure than the preceding. Perfectly soluble, but not so rapid in its action as nitrate of soda. It is somewhat firmly retained by the soil, and not so liable as nitrate of soda to be washed out by heavy rains. It is therefore more suitable than nitrate for wet districts.

Good samples contain 95 per cent or more of pure sulphate of ammonia, containing about 19½ per cent nitrogen.

Dried Blood.—A valuable nitrogenous manure, which differs from the above in being insoluble. It must be decomposed in the soil before it yields up its nitrogen to the plant. The nitrogen (10 to 23 per cent) is in the form of albumen.

Horn-dust—Keronikon.—An insoluble nitrogenous manure, containing about 14 per cent nitrogen. Slower than dried blood. Its efficacy as a manure increases the more finely it is ground.

Horn, when in the form of chips or coarse shavings, decomposes extremely slowly, and is not suitable for application as a manure.

Shoddy or Wool-waste.—An insoluble nitrogenous material used chiefly by manure manufacturers as a source of ammonia in dissolved manures. Contains 5 per cent or upwards of nitrogen. It is a useful manure when dissolved.

Leather.—A very insoluble nitrogenous material, yielding about 9 per cent of ammonia, used by manure manufacturers after being melted and ground, but of little value until it has been dissolved.

Peruvian Guano.—A general manure formed of the excrements of fish-eating birds, and containing nitrogenous compounds, phosphates, and potash.

High-class Peruvian guano is rich in nitrogenous matter, a large proportion of which is soluble. A powerful manure, yielding from 7 to 10 per cent nitrogen, a large part of which is immediately available. Phosphates as plant-food, seldom exceeding 30 per cent, but from one-quarter to one-half of the phosphates are soluble. Containing potash, usually about 3 per cent.

Low-class Peruvian guano is poor in nitrogenous matter, yielding only from 2½ to 4 per cent nitrogen. The phosphates are correspondingly high —viz., from 30 to 50 per cent—but the proportion of soluble phosphate is much smaller than in high-class Peruvian guano. Potash occurs to a very small extent—viz., about 1 to 3 per cent.

Genuine Peruvian guano frequently contains a large proportion of stony insoluble matter. It ought to be riddled before purchasing.

Fortified Peruvian Guano,—also called by various names, such as *improved*, *equalised*, &c.—Such guanos are mixtures, with low-class Peruvian guano for a basis. Sulphate of ammonia is added, and perhaps also other nitrogenous matter, to bring them up to the guaranteed analysis.

Dissolved Peruvian Guano.—This is usually Peruvian guano dissolved in sulphuric acid, and fortified with sulphate of ammonia so as to make a strong, active manure.

Ichaboe Guano.—A true guano, of recent formation. It is very rich in nitrogenous matter, which contains from 8 to 13 per cent of nitrogen, but a large part of the nitrogenous matter is in the form of feathers, which are insoluble and of low manurial value, otherwise it resembles high-class Peruvian guano. The total phosphates vary from 18 to 30 per cent, of which from a fourth to a half is usually soluble. There is seldom as much as 2 per cent potash present.

Fish Guano.—Derived from fish-curing yards, and consisting of the heads and offal of fish, dried and ground. Properly speaking, it is not a guano. The name guano is properly applied only to the altered dung of birds and some other animals.

High-class fish-guano contains nitrogenous matter, containing from 8 to 9½ per cent of nitrogen, but it is in the form of insoluble albuminous compounds, which, however, decompose and become available as plant-food. The phosphates range from 18 to 30 per cent, and are all insoluble.

Low-class fish-guanos are substances like the preceding, but containing less nitrogenous matter and more phosphates. They are simply fish-bone manures, with somewhat more ammonia and less phosphate than ordinary bone-meal, and having no real resemblance to a guano.

Fish-guanos are usually impregnated with fish-oil, which detracts from the value of the manure. The oil should not exceed 3 per cent.

Frey-Bentos Guano.—The dried and ground residue and *debris* of animals after the extraction of "Liebig's Extract." It is not a guano. There are various grades of this manure. One contains much bone matter, another a good deal of horn. The best manure is derived from muscular fibre, containing about 11 per cent nitrogen and about 5 per cent phosphate. Sometimes called *meat-meal*. It is a strong nitrogenous manure.

Bone-meal.—Chiefly a phosphatic manure, but containing also nitrogenous matter. Phosphates range from 50 to 55 per cent, according to the purity of the bones, and are insoluble. The nitrogenous matter is also insoluble, and contains from 3½ to 4 per cent of nitrogen. The higher the phosphates the lower the ammonia, and *vice versa.* The finer ground it is, the more speedy is its action.

Bone-dust.—A coarser ground bone than the preceding.

Crushed Bones.—Still coarser ground.

Steamed Bone Flour.—Bones which have been subjected to steam at high pressure for the extraction of glue or gelatine. The residue contains from 56 to 65 per cent phosphates, and about 1 per cent of nitrogen. It is white-coloured and friable, and can be crushed with the hand. It is able to be, and ought to be, ground to a fine flour.

Pure Dissolved Bones.—Bones dissolved in sulphuric acid. It contains usually less than 20 per cent soluble phosphate, about 10 to 20 per cent of insoluble phosphate, and contains from 2½ to 3 per cent nitrogen. A large proportion of the insoluble phosphate may consist of "precipitated" phosphate, which is quite as useful as soluble phosphate.

Dissolved Bone Manures.—These are compound manures, consisting of any mixture of phosphatic and nitrogenous materials which can be dissolved, with some admixture of bone, so as to produce a manure containing from 15 to 30 per cent soluble phosphates, and from 1 to 2½ per cent nitrogen. *Dissolved bone manures* frequently contain some bone material that has not been dissolved.

Superphosphates.—Phosphates dissolved with sulphuric acid. Their composition varies according to the richness of the phosphate from which they are made, and the extent to which they have been dissolved. If mixed with nitrate of soda, except in very small quantity, it causes loss from escape of nitrous fumes, which are injurious when breathed.

High-class superphosphates are made from phosphates containing a high percentage of phosphate of lime, and are very thoroughly dissolved. They should contain between 35 and 40 per cent soluble phosphate.

Low-class superphosphates usually contain 26 to 28 per cent soluble phosphate.

Mineral Phosphates exist in great variety, and contain very various proportions of phosphate of lime—viz., from 20 to 90 per cent. They are of use as manures only when they are ground to the finest flour.

Thomas-Slag, Basic Slag, or Slag Phosphate Meal.—A substance obtained as a waste product in the dephosphorising of steel. It contains from 30 to 40 per cent phosphate of lime, and should be manufactured into a powder of extreme fineness, 80 per cent at least passing through No. 100 wire-cloth. It is more soluble and available for plant-food than ground mineral phosphates. It may be mixed with nitrate of soda, but *not with sulphate of ammonia,* because it contains caustic lime, which would cause loss of ammonia.

Compound Manures.—These are general manures containing nitrogenous matter, phosphates, and potash, and their value depends not only on the amounts of these constituents, but also on their fineness of division, their solubility, and the sources from which their ingredients are derived.

The general character of a few of the more common of these may be indicated thus:—

Turnip Compounds.—These usually contain from 25 to 35 per cent phosphates, of which the half or more is soluble, and nitrogenous matter, containing 1½ to 3 per cent nitrogen, and sometimes 1 or 2 per cent of potash.

Potato Compounds.—These are somewhat like the preceding, but contain usually less phosphate and a little more nitrogen (from 4 to 7 per cent); sometimes they contain no potash, but more frequently about 3 or 4 per cent is present, and in some instances twice as much.

Bean Compounds.—These may contain from 10 to 20 per cent phosphates, nitrogenous matter containing 1 to 3 per cent nitrogen, and usually a considerable proportion of potash, often as much as from 10 to 20 per cent.

Cereal Compounds.—These usually contain about 20 per cent phosphates, mostly soluble, and nitrogenous matter, partly as nitrates, containing 3 to 6 per cent nitrogen, and they may also contain potash.

Grass Compounds—These are somewhat like the preceding, but may contain less phosphates and more nitrogen, part of which is usually in the form of nitrate.

NOTES REGARDING MANURIAL CONSTITUENTS.

The three important constituents of purchased manures are phosphates, nitrogenous matter, and potash salts.

The phosphates are described in analytical reports as containing phosphoric acid equal to so much "phosphate of lime"; the nitrogenous matter as containing so much nitrogen (equal to so much "ammonia"); the potash salts as containing so much anhydrous "potash."

1. Phosphates.—The phosphates occurring in manures are known to chemists as ortho-phosphates, and they are of three kinds, which may be thus represented :—

Lime Lime Lime } Phosphoric acid.	Lime Lime Water } Phosphoric acid	Lime Water Water } Phosphoric acid.
Tricalcic phosphate.	*Dicalcic phosphate.*	*Monocalcic phosphate.*

Tricalcic phosphate is the natural phosphate occurring in bones and mineral phosphates. It is insoluble in water, and contains, when pure, about 46 per cent phosphoric acid.

Monocalcic phosphate is formed from tricalcic phosphate by dissolving it in acid, which takes away two-thirds of its lime, and replaces it with water. It is soluble in water, and contains, when pure, about 60 per cent phosphoric acid.

Dicalcic phosphate is intermediate between these two, and is formed by their union. This union occurs in the case of phosphates which have been treated with less acid than is required to dissolve them entirely—*e.g.*, in pure dissolved bones, and it is usually called *precipitated* or *reverted* phosphate. It contains, when pure, about 52 per cent phosphoric acid, is insoluble in water, but soluble in certain saline solutions, and is nearly as active manurially as monocalcic phosphate.

"Soluble phosphate" ought, strictly speaking, to mean monocalcic orthophosphate, but according to trade usage it does not. It means that amount of tricalcic phosphate which by means of acid has been converted into monocalcic phosphate, or in other words, the insoluble phosphate that has been rendered soluble. There is a certain advantage in expressing all kinds of phosphate in terms of their equivalent of tricalcic phosphate.

Phosphates of magnesia, of iron, and of alumina, when occurring in small proportion, are not usually estimated separately, but are reckoned as phosphate of lime.

2. Nitrogen occurs in manures mostly in three forms—Ammonia salts, nitrates, and albuminoid matter.

Ammonia sulphate (pure) contains 21⅕ per cent nitrogen, or 25¾ per cent ammonia.

Ammonium chloride (pure) contains 26 per cent nitrogen, or 31¾ per cent ammonia.

Nitrate of soda (pure) contains 16½ per cent nitrogen, equal to 20 per cent ammonia.

Albuminoid matter contains from 14 to 16 per cent nitrogen, equal to from 17 to 19 per cent ammonia, most of which sooner or later becomes available as plant-food.

3. **Potash** occurs mostly in the form of soluble salts, and should be reckoned as anhydrous potash (K_2O).

Sulphate of potash (pure) contains potassium = 54 per cent anhydrous potash.

Muriate of potash (pure) or potassium chloride contains potassium = fully 63 per cent anhydrous potash.

FEEDING STUFFS—THEIR COMPOSITION AND CHARACTERISTICS.

These are concentrated forms of fodder, whose value depends upon their *albuminoid matter*, *oil*, and *carbohydrates* (such as starch and sugar).

Linseed (seed of *Linum usitatissimum*, Common Flax).—Bombay seed large and pale; Baltic seed smaller and dark brown, more liable to impurities than Bombay seed; should be crushed and plotted before feeding. Useful in calf fodders, also for milk-giving, and in the last stage of masting. Quantity, 1 to 3 lb. per 1000 lb. L.W.

Linseed-cake.—Much approved feeding cake; merits well known. Home-made cake usually softer and more oily than foreign. Very hard-pressed cake is low in oil, and not so easily eaten and digested. Linseed-cakes usually impure. Chief impurities, locust-beans added to give flavour and relish, rape-seed, less frequently chaff, and weed-seeds from badly screened seed. Should be broken to small pieces before feeding. Quantity, 2 to 6 lb. per 1000 lb. L.W.

Rape-cake (seed of *Brassica napus* and *B. campestris*).—It has a greenish mottled appearance and a bitter taste, which renders it distasteful to cattle at first. Should be given in small quantity to begin with. Not suited for calves. When given to milch cows, the quantity should not exceed 2 or 3 lb. per head per day, or it will give a disagreeable taste to milk and butter. Sometimes very impure. A dangerous impurity is mustard-seed. May be detected by steeping in cold water for some hours, and noting smell of mustard. Danger may be avoided by steeping the ground cake in *boiling* water.

Poppy-cake (seed of *Papaver somniferum*)—Contains a savoury and easily digestible oil. May be fed to cattle in considerable quantity—5 to 8 lb. per head per day. More than 5 lb. per head per day to milch cows detracts from flavour of butter.

Hemp-cake (seed of *Cannabis sativa*).—Not much used for feeding. Not so digestible as the above, owing to abundance of woody fibre (25 per cent). Fed chiefly to horses and sheep. To milch cows not more than 1 lb. per head per day. Apt to grow mouldy in summer.

Sunflower-cake (seed of *Helianthus annuus*).—Relished by stock, and well digested.

Cotton-cake (seed of *Gossypium hirsutum*, &c.) *Undecorticated.*—Best quality from Egyptian and Sea Island seed. Inferior qualities are woolly, and to be avoided. Husk has astringent properties, and is a good cure for *scour*. Should be ground to the size of linseed. Not very digestible, owing to abundance of woody fibre (28 per cent). Should be used freshly made, because liable to mould on keeping.

Decorticated—viz., cotton-cake deprived of the husk.—A very concentrated and powerful bye-fodder. Should be given with caution, crushed fine, and mixed with Indian corn, oats, or other farinaceous food. Large quantity is injurious, and may even be fatal. Very variable in composition. Frequently very hard pressed, and therefore indigestible. When freshly made, softly pressed, and of good quality, it is a valuable bye-fodder. Oil very bland and digestible; used to adulterate olive-oil.

Sesame-cake (seed of *Sesamum orientale*).—Seed imported from India. Excellent bye-fodder, easily digested, much relished by all kinds of stock. Favourable for milk-giving, and also for masting. Oil bland and digestible, and much in favour for making margarine.

Rice-meal (seed of *Oryza sativa*).—The meal is a bye-product obtained in preparing rice for the market. A very good, safe, and acceptable fodder, but less concentrated than ordinary oilcakes. Varies very much in quality, and frequently adulterated with meal derived from rice husks. Much relished by stock, and useful for milch cows as well as for fattening animals.

Rye-meal.—Is the bran of rye, and rather more concentrated than wheat bran. It is very good fodder for cattle and sheep, but not for horses.

Barley-bran.—The residue obtained in the manufacture of pearl barley. An excellent fodder much liked by cattle; not much liked by sheep.

Palm-kernel Cake.—An excellent, palatable, and easily digested bye-fodder. Especially good for milch cows Increases the proportion of fat in milk. Puts a finish upon fattening stock. When ground to powder and most of the oil extracted, it is sold as *Palm-kernel meal*, a much relished and digestible bye-fodder. A useful addition to calf-meals.

Earth-nut Cake.—The pressed seed of a leguminous plant (*Arachis hypogæa*). The most concentrated of all cakes, containing from 45 to 50 per cent albumen and 6 to 9 per cent of oil. It is very palatable and digestible. A nutritious fodder when given in moderation. Apt to be contaminated with hair, and liable to rot on keeping if badly made.

Flesh-meal.—Residue obtained in the manufacture of *Liebig's Extract of Beef.* A highly nitrogenous bye-fodder, most suitable for enriching a too farinaceous dietary, such as potatoes. Much used in that way as a swine fodder. Easily digested, and readily accepted by cattle.

Fish-meal.—Bye-product of fish-curing yards, made chiefly from the heads of cod and tusk. Resembling fish-guano in composition, but somewhat variable. Highly phosphatic, and therefore useful as a bye-fodder to young growing cattle. Ratio, from 1 to 3 lb. per head per day.

Herring-meal.—A very oily fodder, useful as an adjunct to the dietary of milch cows. Quantity, 1 to 4 lb. per head per day.

Locust-beans—*Carob Bean.*—A sugary fodder, most palatable and acceptable to all kinds of stock. Used to mix with oilcakes and meals, so as to improve their flavour.

Dried Grains.—The draff from distilleries and breweries dried so as to contain only about 10 per cent water. It is a first-class feeding-stuff if of good quality, but the qualities differ considerably.

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THE COMPOSITION OF FEEDING-STUFFS.

The following is the average composition of genuine cakes and meals in common use:—

	Albuminoids.	Oil.	Carbohydrates.
Linseed-cake . .	29	11	32
Rape-cake . . .	31	10	30
Poppy-cake . . .	35	10	22
Hemp-cake . . .	30	8½	17
Sunflower-cake . .	33	9	27
Cotton-cake . . .	28	7½	30
„ (decorticated)	44	15	20
Sesame-cake . .	37	13	21
Rice-meal . . .	11	10	50
Paisley meal . .	15	9	60
Maize-meal . . .	10	5	65
Rye-meal . . .	14·5	3½	60
Wheat-bran . . .	13·5	3½	56
Barley-bran . . .	15	5	50
Palm-kernel cake . .	17	10	41
Palm-kernel meal . .	19	3½	44
Earth-nut cake (shelled)	47	7½	25
Flesh-meal . . .	71	13	...
Fish-meal . . .	50	4	...
Locust-bean meal . .	4	2	74
Linseed . . .	21	37	20
Dried grains . .	20	8	50

USEFUL FACTORS.

Amount of	Multiplied by	Gives corresponding amount of
Nitrogen	1·214	Ammonia.
″	6·3	Albuminoid matter.
″	4·714	Sulphate of ammonia.
″	4·50	Nitric acid.
″	6·071	Nitrate of soda.
Ammonia	·824	Nitrogen.
″	3·882	Sulphate of ammonia.
″	3·706	Nitric acid.
″	5·0	Nitrate of soda.
Potash (anhydrous) . .	1·85	Sulphate of potash.
″	1·585	Muriate of potash.
Phosphoric acid (anhydrous) .	2·183	[1] Phosphate of lime.
″ ″	1·4	Biphosphate.
″ ″	1·648	[2] Soluble phosphate.
Soluble phosphate [2] . .	1·325	[1] Phosphate of lime.
Biphosphate	1·566	″
Lime	1·845	″
″	1·786	Carbonate of lime.
Chlorine	1·648	Chloride of sodium.

[1] Tricalcic ortho-phosphate ($3CaO, P_2O_5$).
[2] Monocalcic ortho-phosphate ($CaO, 2H_2O, P_2O_5$).

FORMS OF GUARANTEE

GUARANTEE OF MANURE.

I guarantee that the manure called.....................and sold by me to ....contains a minimum of—

Soluble phosphoric acid =Phosphate of lime dissolved ....per cent.
Insoluble phosphoric acid=Phosphate of lime undissolved.........per cent.
Potash salts . . =Potash (K_2O) . . . .per cent.
Total nitrogen . . =Ammonia . . . . per cent.

Signature of seller.......................
Date............. 18 ..

GUARANTEE OF FEEDING-STUFF.

I guarantee that the feeding-stuff called..............and sold by me to ....contains a minimum of—

.... per cent albuminoids.
.... .. per cent oil.
.... per cent carbohydrates.

Signature of seller.......................
Date 18

UNITS TO BE USED IN DETERMINING THE COMMERCIAL VALUE OF MANURES.[1]

Terms—CASH, including Bags gross weight—not including Carriage.

N B—These units are based on the present RETAIL PRICES at principal seaports. When these units are multiplied by the percentages in the analysis of a Manure, they will produce a value representing very nearly the cash price at which one SINGLE TON may be bought in fine sowable condition. Larger purchases may be made on more favourable terms

CASH PRICES AS FIXED ON 18TH JANUARY.

For Season 1899

Items to be Valued		Guanos.		Bone Manures.			Superphosphates
		Ichaboe	Peruvian (Riddled)	Bone-Meal	Steamed Bone Flour.	Dissolved or Vitriolated Bones.	
Phosphates dissolved . .		1/9	1/6	..	.	3/	1/10
" undissolved . .				1/3	1/3	1/2	..
Nitrogen		12/9	15/-	12/-	12/-	12/-	
or Ammonia		10/6	12/6	10/-	10/-	10/-	.
Prices per ton, Jan. 18, 1899	From	190/-	80/-	110/-	95/-	105/-	26°/₀=47/6
	to	215/-	155/-	120/-	100/-	110/-	36°/₀=65/-

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[1] See Note, p. 47.

MANURES	Guarantee	Price per Ton	Unit.
	Per cent	£ s d	
Sulphate of ammonia	24 Am	10 10 0	Am = 8/9
Nitrate of soda, 95 per cent[1]	19 "	7 15 0	" = 8/2
Muriate of potash, 80 per cent	50 Pot	8 15 0	Pot = 3/6
Sulphate of potash, 50 per cent	27 "	5 0 0	" = 3/9
Kainit	12 "	2 0 0	" = 3/4
Ground Charleston phosphate	57 Phos	2 0 0	Phos = 0/9
Thomas slag phosphate	30 "	1 17 6	" = 1/3

FEEDING STUFFS	Analyses			Price per Ton in bags
	Album	Oil	Carbohydrates	£ s d
Linseed cake	28	9	35	7 15 0
" Canadian	28	8	35	6 15 0
Decorticated cotton cake	45	10	20	5 15 0
Undecorticated do	24	7	25	4 10 0
Bean meal	25	2	50	[illegible] 4 0
Locust bean meal	6	2	70	6 15 0
Dried grains	20	8	50	4 5 0
Barley bran	15	5	50	4 15 0
Indian corn[1]	10	5	55	4 16 0
Paisley meal	15	9	60	4 10 0
Linseed (whole)	20	35	14	11 10 0
Linseed oil		..		1[illegible] 0 0
Molasses				4 15 0

[1] Subject to monthly variation

CLASSIFICATION OF MANURES.

Bone-meal	Genuine bone-meal contains from 48 per cent to 55 per cent phosphates, and from 3½ per cent to 4 per cent nitrogen If phosphates are low nitrogen will be high, and conversely.
Steamed bone-flour	Ground to flour and containing about 60 per cent phosphates, and about 2 per cent nitrogen
Dissolved bones	Must be pure—i e, containing nothing but natural bones and sulphuric acid.
Mixtures	To be valued according to the unit values (as given above) of the ingredients of which they are guaranteed *and also found* to be composed, with an addition of from 5 to 10 per cent, according to the fineness of their manufacture
Thomas-slag and ground phosphates	Fineness of grinding is of paramount importance. The coarsest kind used should be so finely ground that 80 per cent passes through a sieve of 10,000 holes per sq inch

INSTRUCTIONS FOR VALUING MANURES.

The commercial values of manures are determined by means of the Units in the following manner .—

Take the analysis of the manure, and look for the following substances :—

Phosphates dissolved (or soluble phosphate)
„ undissolved (or insoluble „)
Nitrogen . . . .
Potash . . . .

No other items but these are to be valued.

Should the analysis or the guarantee not be expressed in that way, the chemist or the seller should be asked to state the quantities in these terms.

Suppose the manure is bone-meal :—

An ordinary bone-meal will contain about 50 per cent phosphate and 4 per cent nitrogen The units for bones are 1s 3d. for phosphate and 12s for nitrogen. Therefore the value is—

				£	s.	d.
Insol. phosphate,	50 times	1s 3d.,	equal to	£3	2	6
Nitrogen,	4 „	12s.,	„	2	8	0
			Say	£5	10	6 per ton

Suppose the manure is dissolved or vitriolated bones :—

It must be guaranteed "pure "

The units in the Schedule are 3s for soluble phosphate, 1s. 2d. for insoluble phosphate, and 12s. for nitrogen.

The analysis will be about 16 per cent soluble phosphate, 20 per cent insoluble phosphate, and 2½ per cent nitrogen. In that case the value would be—

				£	s.	d.
Sol. phosphate,	16 times	3s.,	equal to	£2	8	0
Insol. „	20 „	1s. 2d.,	„	1	3	4
Nitrogen,	2½ „	12s.,	„	1	10	0
			Say	£5	1	4 per ton.

Suppose the manure is a superphosphate,—say an ordinary superphosphate, with 28 per cent soluble phosphate and 3 per cent insoluble phosphate. It is valued thus—

Sol. phosphate, 28 times 1s. 10d., equal to, say, £2, 11s. 4d. per ton.
Insoluble phosphate is not valued in a superphosphate.

Note.—The units have reference solely to the COMMERCIAL VALUES of Manures, and not to their AGRICULTURAL VALUES.

Thus, in stating soluble phosphate in dissolved bones at 3s. per unit, and that in superphosphate at 1s. 10d., it is meant that these are the prices per unit at which soluble phosphate can be bought in these two manures; but it does not mean that the soluble phosphate in the one is 1s 2d. per unit better as a manure than that in the other. It is probably no better.

BOTANICAL DEPARTMENT

Consulting Botanist to the Society—A. N. M'ALPINE,
60 John Street, Glasgow.

The Society have fixed the following rates of charge for the examination of plants and seeds for the *bona fide* and individual use and information of members of the Society (not being seedsmen), who are particularly requested, when applying to the Consulting Botanist, to mention the kind of examination they require, and to quote its number in the subjoined schedule. The charge for examination must be paid at the time of application, and the carriage of all parcels must be prepaid.

Scale of Charges.

1. A report on the purity, amount, and nature of foreign materials, 2s.
2. On the germinating power of a sample of seed, 2s.
3. Determination of the species of any weed or other plant, or of any vegetable parasite, with a report on its habits and the means for its extermination or prevention, 5s.
4. Report on any disease affecting farm crops, 5s.
5. Determination of the species of any natural grass or fodder plant, with a report on its habits and pasture or feeding value, 1s.

The Consulting Botanist's Reports are furnished to enable members—purchasers of seeds and corn for agricultural purposes—to test the value of what they buy, and are not to be used or made available for advertising or trade purposes by seedsmen or otherwise.

Instructions for Selecting and Sending Samples.

In sending seed or corn for examination, the utmost care must be taken to secure a fair and honest sample. In the case of grass seeds, the sample would be drawn from the centre of the sack or bag, and in all cases from the bulk delivered to the purchaser. If anything supposed to be injurious or useless exists in the corn or seed selected, samples should also be sent.

When possible, at least one ounce of grass and other small seeds should be sent, and two ounces of cereals or larger seeds. The exact name under which the seed has been bought (but preferably, a copy of the invoice) should accompany the sample.

Grass seeds should be sent at least four weeks, and clover seeds three weeks, before they are to be used.

In collecting specimens of plants, the whole plant should be taken up and the earth shaken from the roots. If possible, the plants must be in flower or fruit. They should be packed in a light box, or in a firm paper parcel.

Specimens of diseased plants or of parasites should be forwarded as fresh as possible. Place them in a bottle, or pack them in tinfoil or oil-silk.

All specimens should be accompanied with a letter specifying the nature of the information required, and stating any local circumstances (soil, situation, &c.) which, in the opinion of the sender, would be likely to throw light on the inquiry.

It is strongly recommended that members purchasing seeds should insist—

(1) Upon having from the seller a guarantee stating the purity and germination of the seed supplied.

(2) That the bulk be same as sample.

(3) That it contain not more than 5 per cent other than the species ordered.

If the purity and germination of the seed is not known, it is impossible to tell either its money value or the proper amount to be sown.

It is also strongly recommended that the purchase of prepared mixtures should be avoided, and the different seeds to be used should be purchased separately.

Parcels or letters containing seeds or plants for examination (carriage or postage paid) must be addressed to Professor M'Alpine, Botanical Laboratory, 60 John Street, Glasgow.

INSECT PESTS.

Arrangements have been made with Mr R. Stewart MacDougall, M.A., D.Sc., Edinburgh, to advise members of the Society regarding insects or allied animals which, in any stage of their development, infest—

(*a*) Farm crops.
(*b*) Stored grain.
(*c*) Garden and greenhouse plants.
(*d*) Fruit and fruit trees.
(*e*) Forest trees and stored timber.
(*f*) Live stock (including poultry).

Members consulting Mr MacDougall will please forward with their queries examples of the injured plants, or the injured parts of plants, &c., as well as specimens of the insects or other animals believed to be the cause of the injury.

Specimens should be sent in tin or wooden boxes, or in quills, to prevent injury in transmission.

Address letters and parcels (carriage or postage paid) to R. Stewart MacDougall, 3 Mertoun Place, Edinburgh.

The Directors have fixed the fee payable by members to Mr MacDougall at 1s. for each case upon which he is consulted; this fee must be sent to him along with the application for information.

PREMIUMS

GENERAL REGULATIONS FOR COMPETITORS.

1. It is to be distinctly understood that the Society is not responsible for the views, statements, or opinions of any of the writers whose papers are published in the 'Transactions.'

2. All reports must be legibly written, and on one side of the paper only; they must specify the number and subject of the Premium for which they are in competition; they must bear a distinguishing motto, and be accompanied by a sealed letter, similarly marked, containing the name and address of the reporter—initials must not be used.

3. No sealed letter, unless belonging to a report found entitled to the Premium offered, or a portion of it, will be opened without the author's consent.

4. Reports for which a Premium, or a portion of a Premium, has been awarded, become the property of the Society, and cannot be published in whole or in part, nor circulated in any manner, without the consent of the Directors. All other papers will be returned to the authors if applied for within twelve months.

5. The Society is not bound to award the whole or any part of a Premium.

6. All reports must be of a practical character, containing the results of the writer's own observation or experiment, and the special conditions attached to each Premium must be strictly fulfilled. General essays, and papers compiled from books, will not be rewarded or accepted. Weights and measurements must be indicated by the imperial standards.

7. The Directors, before or after awarding a Premium, shall have power to require the writer of any report to verify the statements made in it.

8. The decisions of the Board of Directors are final and conclusive as to all matters relating to Premiums, whether for Reports or at General or District Shows; and it shall not be competent to raise any question or appeal touching such decisions before any other tribunal.

9. The Directors will welcome papers from any Contributor on any suitable subject not included in the Premium List; and if the topic and the treatment of it are both approved, the writer may be remunerated, and his paper published.

CLASS I.

REPORTS.

SECTION 1.—THE SCIENCE AND PRACTICE OF AGRICULTURE.

FOR APPROVED REPORTS.

1. On the results of experiments for fixing and retaining the volatile and soluble ingredients in Farmyard Manure—Twenty Sovereigns. To be lodged by 1st November in any year.

The Report must detail the treatment adopted to fix and retain these ingredients—the materials used for that purpose, and the quantity and cost thereof—comparative analyses of the manure with and without the treatment, and also a statement of the crops grown with manure and without such treatment, must be given by the Reporter. The experiments to have extended over at least two years and crops.

2. On experiments for ascertaining the actual addition of weight to growing or fattening Stock, by the use of different kinds of food—Twenty Sovereigns. To be lodged by 1st November in any year.

The attention of the experimenter is directed to turnips, carrots, beet, mangel-wurzel, potatoes, cabbage, as well as to beans, oats, barley, wheat, Indian corn, linseed, oilcake or rape-cake, and to the effect of warmth and proper ventilation, and the difference between food cooked and raw. The above roots and other kinds of food are merely suggested; competitors are neither restricted to them nor obliged to experiment on all of them.

When experiments are made with linseed and cake, attention should be paid to the comparative advantages, economically and otherwise, of the substance in these two states.

Before commencing the comparative experiments, the animals must be fed alike for some time previously.

The progress of different breeds may be compared. [illegible] will form an interesting experiment of itself, for Reports of whi[illegible]uragement will be given.

N.B.—The experiments specified in the two previous subjects must be conducted over a period of not less than three months. No lot shall consist of fewer than four Cattle or ten Sheep. The animals selected should be of the same age, sex, and breed, and as nearly as possible of the same weight, condition, and maturity. The live weight before and after the experiment must be stated, and if killed, their dead weight and quantity of tallow.

3. On any useful practice in Rural Economy adopted in other countries, and susceptible of being introduced with advantage into Scotland—The Gold Medal. To be lodged by 1st November in any year.

The purposes chiefly contemplated by the offer of this premium is to induce travellers to notice and record such particular practices as may seem calculated to benefit Scotland. The Report to be founded on personal observation.

SECTION 2.—ESTATE IMPROVEMENTS.

FOR APPROVED REPORTS.

1. By the Proprietor in Scotland who shall have executed the most judicious, successful, and extensive Improvement—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

Should the successful Report be written for the Proprietor by his resident factor or farm manager, a Minor Gold Medal will be awarded to the writer in addition to the Gold Medal to the Proprietor.

The merits of the Report will not be determined so much by the mere extent of the improvements, as by their character and relation to the size of the property. The improvements may comprise reclaiming, draining, enclosing, planting, road-making, building, and all other operations proper to landed estates. The period within which the operations may have been conducted is not limited, except that it must not exceed the term of the Reporter's proprietorship.

2. By the Proprietor or Tenant in Scotland who shall have reclaimed within the ten preceding years not less than forty acres of Waste Land—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

3. By the Tenant in Scotland who shall have reclaimed within the ten preceding years not less than twenty acres of Waste Land —The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

4. By the Tenant in Scotland who shall have reclaimed not less than ten acres within a similar period—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November in any year.

The Reports in competition for Nos. 3, 4, and 5 may comprehend such general observations on the improvement of waste lands as the writer's experience may lead him to make, but must refer especially to the lands reclaimed—to the nature of the soil—the previous state and probable value of the subject—the obstacles opposed to its improvement—the details of the various operations—the mode of cultivation adopted—and the produce and value of the crops produced. As the required extent cannot be made up of different patches of land, the improvement must have relation to one subject; it must be of profitable character, and a rotation of crops must have been concluded before the date of the Report. *A detailed statement of the expenditure and return* **and a certified measurement of the ground are requisite.**

5. By the Proprietor or Tenant in Scotland who shall have improved within the ten preceding years the Pasturage of not less than thirty acres, by means of top-dressing, draining, or otherwise, without tillage, in situations where tillage may be inexpedient—The Gold Medal, or Ten Sovereigns. To be lodged by 1st November in any year.

6. By the Tenant in Scotland who shall have improved not less than ten acres within a similar period—The Minor Gold Medal. To be lodged by 1st November in any year.

Reports in competition for Nos. 5 and 6 must state the particular mode of management adopted, the substances applied, the elevation and nature of the soil, its previous natural products, and the changes produced.

SECTION 3.—HIGHLAND INDUSTRIES AND FISHERIES.

FOR APPROVED REPORTS.

1. The best mode of treating native Wool; cleaning, carding, dyeing, spinning, knitting, and weaving by hand in the Highlands and Islands of Scotland—Five Sovereigns. To be lodged by 1st November 1899.

SECTION 4.—MACHINERY.

FOR APPROVED REPORTS.

SECTION 5.—FORESTRY DEPARTMENT.

FOR APPROVED REPORTS.

1. On Plantations of not less than eight years' standing formed on deep peat-bog—The Medium Gold Medal, or Five Sovereigns. To be lodged by 1st November 1899.

The premium is strictly applicable to deep peat or flow moss; the condition of the moss previous to planting, as well as at the date of the Report, should, if possible, be stated.

The Report must describe the mode and extent of the drainage, and the effect it has had in subsiding the moss—the trenching, levelling, or other preliminary operations that may have been performed on the surface—the mode of planting—kinds, sizes, and number of trees planted per acre—and their relative progress and value, as compared with plantations of a similar age and description grown on other soils in the vicinity.

CLASS II.

DISTRICT COMPETITIONS.

REGULATIONS 1899.

The Money Premiums and Medals awarded at District Competitions will be sent direct to the winners in January next. No payments must therefore be made by the Secretary or Treasurer of any local Association.

Grants in aid of DISTRICT COMPETITIONS *for* 1900 *must be applied for before* 1*st November* 1899, *on Forms to be obtained from the Secretary.*

When a Grant has expired, the District cannot apply again for aid for two years.

SECTION I.—GRANTS TO DISTRICT SOCIETIES FOR HORSES, CATTLE, SHEEP, AND PIGS.

1. CLASS OF STOCK—LIMIT OF GRANTS, £340.—The Highland and Agricultural Society will make Grants to District Societies to deal with, as in the opinion of the District Societies the need of each district may require, for such classes of breeding Stock of Horses, Cattle, Sheep, and Pigs as are embraced in the General Show Prize List of the Highland and Agricultural Society. The total sum to be expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £340 in any one year.

2. GRANT TO DISTRICT, £12.—The portion of the Grant to any one District Society shall not exceed the sum of £12 in any one year.

3. CONTINUANCE OF GRANT THREE YEARS—ADVERTISING.—The Grant shall continue for three alternate years, provided always that the District Society shall, in the two intermediate years, continue the competition by offering Premiums equal in amount to not less than one-half the sum given by the Highland and Agricultural Society, and for the same class of Stock as that selected in each previous year to compete for the Highland and Agricultural Society's Prizes. The Prizes when given by the Highland and Agricultural Society must be announced as the Society's gift. If no competition takes place for two years the Grant expires.

4. When it is agreed to hold the General Show of the Society in any district, no provincial show shall be held in that district in the months of June, July, or August.

5. MEDALS.—In the two alternate years the Highland and Agricultural Society will place three Silver Medals at the disposal of the District Societies, for the same classes of Stock as those for which the Money Premiums are offered, provided that not less than three lots are exhibited in the same class.

6. RULES OF COMPETITION.—The Rules of Competition for the Premiums, the Funds for which are derived from Grants of the Highland and Agricultural Society, shall be such as are generally enforced by the Society receiving the Grant for Premiums offered by itself.

7. Area and Parishes—Five Parishes.—When making application for Grants from the Highland and Agricultural Society, the District Society must delineate the area and the number of parishes comprised in the district, and, *except in special cases*, no District Society shall be entitled to a Grant whose show is not open to at least *five* Parishes.

8. Nomination of Members.—The Directors may nominate one or more members of the Highland and Agricultural Society resident in the district, whose duty it shall be to see that the conditions imposed by the Board are complied with.

9. Reports.—Blank Reports will be furnished to the Secretaries of the different District Societies. These Reports must in all details be completed and lodged with the Secretary of the Highland and Agricultural Society on or before the 1st of November next following the competition, both in the years when the Grant is given and in the two intermediate years, for the approval of the Directors of the Highland and Agricultural Society, against whose decision there shall be no appeal. All such Reports must be signed and certified by the Members of the Highland and Agricultural Society nominated under Rule 8.

10. Grants—When Paid.—The Grants made to District Societies will be paid in the January following the competition, by Precepts issued by the Directors of the Highland and Agricultural Society to the winners of the prizes. No payments of these Grants must be made by the Secretary or Treasurer of any District Society. Medals will be issued at the same time.

11. Renewal of Application.—No application for renewal of a Grant to a District Society will be entertained until the expiration of *two years* from the termination of the last Grant.

12. Disposal of Applications.—In disposing of applications for District Grants, the Directors of the Highland and Agricultural Society shall keep in view the length of interval that has elapsed since the expiration of the last Grant, giving priority to those District Societies which have been longest off the list.

13. Dairy Produce.—Upon application being made by District Societies, a limited number of Medals will be placed at the disposal of District Societies for Dairy Produce.

DISTRICTS.

1. Aberdour.—*Convener*, James Milne, Pittendrum, Pitsligo, Fraserburgh; *Secretary*, Alex. S. Morrison, Stonebriggs, Aberdour, Fraserburgh. Granted 1895.
2. Vale of Alford.—*Convener*, George Wilken, The Cottage, Waterside, Alford, N.B; *Secretary*, Alex Dunn, North of Scotland Bank, Alford, N.B. Granted 1895.
3. Caithness.—*Convener*, John Miller of Scrabster, Thurso; *Secretary*, James Shearer, Bank of Scotland, Wick Granted 1895.
4. Black Isle.—*Convener*, J. W. Lumsden, Navity, Cromarty; *Secretary*, Thomas Henderson, Fortrose. Granted 1895.
5. Kinglassie.—*Convener*, William Meiklem, Begg, Kirkcaldy; *Secretary*, William Ness, Walkerton, Leslie. Granted 1894. (In abeyance in 1896 on account of the Perth Show.)
6. Weem.—*Convener*, Robert Menzies, Tirinie, Aberfeldy; *Secretary*, John M. Menzies, Camserney Cottage, Aberfeldy. Granted 1894. (In abeyance in 1896 on account of the Perth Show.)
7. Argyll.—*Convener*, D. C. MacDougall, Ashens, Tarbert, Lochfyne

Secretary, Hugh Mundell, Tarbert, Lochfyne. Granted 1894. (In abeyance in 1897 on account of the Glasgow Show.)

8. CARRICK.—*Convener*, Alexander Cross of Knockdon, 19 Hope Street, Glasgow; *Secretary*, David Brown, Royal Bank, Maybole. Granted 1894. (In abeyance in 1897 on account of the Glasgow Show.)
9. FORTH.—*Convener*, Thomas Nimmo, Lawhead, Forth, Lanark; *Secretary*, John Robertson, Forth, Lanark. Granted 1894. (In abeyance in 1897 on account of the Glasgow Show.)
10. NITHSDALE.—*Convener*, William Barber, Tererran, Moniaive; *Secretary*, Robert Wilson, Solicitor, Thornhill. Granted 1897.
11. KIRRIEMUIR.—*Convener*, T. M. Nicoll, Littleton, Kirriemuir; *Secretary*, Stewart Lindsay, Crawford Park, Kirriemuir. Granted 1897.
12. SUTHERLAND.—*Convener*, R. R. Hill, Navidale House, Helmsdale; *Secretary*, J. Mackintosh, Proncy, Dornoch. Granted 1897.
13. WEST OF SCOTLAND UNION.—*Convener*, ; *Secretary*, John Watson, National Bank, Crosshill, Glasgow. Granted 1899.
14. LAMMERMOOR PASTORAL.—*Convener*, George G. Turnbull of Abbey St Bathans, Grants House; *Secretary*, Thomas Stephenson, Chapel, Duns. Granted 1899.
15. STIRLING.—*Convener*, James Paterson, Burnbank, Blair-Drummond; *Secretary*, Andrew C. Buchanan, 26 Port Street, Stirling. Granted 1899.
16. BUCHAN.—*Convener*, William Ainslie, Parkwell, Mintlaw; *Secretary*, James Smith, Town and County Bank, Strichen. Granted 1896.
17. ROYAL NORTHERN.—*Convener*, George J. Walker, Portlethen, Aberdeen; *Secretary*, R. R. Ross, 35 Market Street, Aberdeen. Granted 1896.
18. MID-ANNANDALE.—*Convener*, James Lindsay, Whitecastles, Lockerbie; *Secretary*, John A. Mackenzie, Solicitor, Lockerbie. Granted 1896.
19. INVERURIE.—*Convener*, George Bruce, Heatherwick, Inverurie; *Secretary*, James Stephen, Lethenty, Inverurie. Granted 1898.
20. KINTYRE.—*Convener*, Capt. D. Stewart, R.N., Knockrioch, Campbeltown; *Secretary*, G. Erskine Inglis, Campbeltown. Granted 1898.
21. ST MARY'S ISLE ESTATES AND DISTRICT.—*Convener*, Robt. F. Dudgeon, The Grange, Kirkcudbright; *Secretary*, John Gibson, Solicitor, Kirkcudbright. Granted 1898.
22. CARNWATH. *Convener*, William Fleming, Calla, Carnwath; *Secretary*, John Robertson, Banker, Carnwath. Granted 1898.
23. BREADALBANE.— *Convener*, Thomas Watters, Glenample, Lochearnhead; *Secretary*, Duncan Campbell, Dundaramh, Killin. Granted 1898.
24. WESTER ROSS.—*Convener*, John Stirling of Fairburn, Muir of Ord; *Secretary*, Ben. Aird, Banker, Dingwall. Granted 1898.
25. STRANRAER AND RHINS OF GALLOWAY.—*Convener and Secretary*, John Bennoch, Solicitor, Stranraer. Granted 1898.
26. DALKEITH.- *Convener*, George Pendreigh, Upper Balhousie, Lasswade; *Secretary*, Archd. Dods, Auctioneer, Dalkeith. Granted 1895. (In abeyance in 1899 on account of the Edinburgh Show.)

In 1899.

Nos. 1, 2, 3, 4, 5, 6, 7, 8, and 9 are in competition for the last year.
Nos. 10, 11, and 12 are in competition for the second year.
Nos. 13, 14, and 15 are in competition for the first year.
Nos. 16, 17, 18, 19, 20, 21, 22, 23, 24, and 25 compete for local Premiums.
No. 26 is in abeyance on account of the Edinburgh Show.

SECTION 2.—GRANTS TO HORSE ASSOCIATIONS, &c., FOR STALLIONS FOR AGRICULTURAL PURPOSES.

1. HORSES—LIMIT OF GRANT, £210.—The Highland and Agricultural Society will make Grants to Horse Associations and other Societies in different districts engaging Stallions for agricultural purposes. The total sum expended by the Highland and Agricultural Society in such Grants shall not exceed the sum of £210 in any one year.

2. GRANT TO EACH, £15.—The portion of the Grant to any one Horse Association, &c., shall not exceed the sum of £15 in any one year.

3. CONTINUANCE OF GRANT THREE YEARS—INTERMEDIATE YEAR.—The Grant shall continue for three alternate years, provided always that the Horse Association or Society shall, in the two intermediate years, offer at least a sum equal in amount to that granted by the Highland and Agricultural Society for the hire of a Horse in connection with the Association or Society to whom the Grant is made.

4. NOMINATION OF MEMBERS.—The Directors of the Highland and Agricultural Society shall nominate one or more members of the Highland and Agricultural Society, resident in the Districts in which the Society benefited is located, whose duty it shall be to see that the conditions imposed by the Board are complied with.

5. REPORTS—PENALTY FOR NOT ENGAGING HORSE.—No Grant by the Highland and Agricultural Society to Horse Associations, &c., will be paid unless a report, signed and certified by the members appointed under Rule 4, be furnished to the Highland and Agricultural Society not later than the 1st of November in each year in which the Grant is made, and also in the alternate years, stating that a Horse has been engaged by the Horse Association or other Society to whom the Grant is made; and in the event of a Horse not being engaged in any one year while the provisions of the Grant are in force, the Grant made by the Highland and Agricultural Society will cease.

6. RULES 10 (Time of Payment), 11 (Renewal of Grant), and 12 (Disposal of Applications) applicable to Section 1, shall be applicable to Section 2.

DISTRICTS.

1. TURRIFF CLYDESDALE HORSE SOCIETY.—*Convener*, William Paterson, The Elms, Turriff; *Secretary*, R. Cruickshank, Claymires, Turriff. Granted 1895.
2. KELSO DISTRICT CLYDESDALE HORSE SOCIETY.—*Convener*, W. G. Hogarth, Linton Bankhead, Kelso; *Secretary*, Adam Riddell, 3 Square, Kelso. Granted 1895.
3. WEST FIFE CLYDESDALE HORSE SOCIETY.—*Convener*, James Law, Spencerfield, Inverkeithing; *Secretary*, James Millar, Waulkmill, Dunfermline. Granted 1897.
4. CARSE OF GOWRIE AND DUNDEE DISTRICT STALLION SOCIETY.—*Convener*, Capt. Clayhills Henderson of Invergowrie, R.N., Dundee; *Secretary*, Alex. Anderson, Berryhill, Dundee. Granted 1897.
5. KILFINAN.—*Convener*, Duncan Thomson, Inveryne, Tighnabruaich; *Secretary*, Neil Nicolson, Auchgoyle, Tighnabruaich. Granted 1899.
6. FYVIE.—*Convener*, James Durno, Eastertown, Old Meldrum; *Secretary*, John Hay, Mill of Crichie, Fyvie. Granted 1899.
7. KINROSS-SHIRE.—*Convener*,
   Secretary, John Hay, Balleave, Kinross. Granted 1899.

8. Glenkens, Balmaghie, and Parton.—*Convener*, W. A. M'Turk, Barlae, Dalry, Galloway; *Secretary*, Robt. T. Scott, Drumhumphrey, Corsock, Dalbeattie. Granted 1899.
9. Machars.—*Convener and Secretary*, Charles M. Routledge, British Linen Co. Bank, Portwilliam. Granted 1899.
10. Western District of Mid-Lothian.—*Convener*, A. Alexander, Cockburnhill, Balerno; *Secretary*, John T. Mungle, Commercial Bank of Scotland, West Calder. Granted 1896.
11. Stirling District Horse Society.—*Convener*, Colonel Murray of Polmaise, Stirling; *Secretary*, Robert Paterson, Hill of Drip, Stirling. Granted 1896.
12. Dumbartonshire Horse-Breeding Society—*Convener*, Charles W. Ralston, Garscube, Maryhill; *Secretary*, William Reid, 140 St Vincent Street, Glasgow. Granted 1898.
13. Selkirk and Galashiels.—*Convener*, John Dun, Craigpark, Galashiels; *Secretary*, David C. Finlay, Elm Cottage, Galashiels. Granted 1898.

In 1899.

Nos. 1 and 2 are in competition for the last year.
Nos. 3 and 4 are in competition for the second year.
Nos. 5, 6, 7, 8, and 9 are in competition for the first year.
Nos. 10, 11, 12, and 13 compete for local premiums.

DAIRY PRODUCE.

Upon application being made by District Societies, a limited number of Silver Medals will be placed at the disposal of District Societies for Dairy Produce.

The Medals are granted for two years, and lapse if not awarded in those years.

Ross-shire.

1. Lochbroom.—*Convener*, Sir J. A Fowler of Braemore, Bart, Inverbroom, Lochbroom; *Secretary*, Hay Mackenzie, Bank Agent, Ullapool. 2 Medals. Granted 1898

SPECIAL GRANTS.

£40 to the Highland Home Industries Association.—*Secretary*, Miss Muriel K. Mackenzie, Conon House, Conon Bridge, Ross-shire.

£20 to the Ayrshire Agricultural Association, to be competed for at the Dairy Produce Show at Kilmarnock.—*Convener*, The Hon. G. R. Vernon, Auchans House, Kilmarnock; *Secretary*, John Howie, Wellington Chambers, Ayr. Granted 1872.

£5 to Shetland Agricultural Society.—*Convener*, John Bruce of Sumburgh, Lerwick; *Secretary*, J. Wilson, Commercial Bank, Lerwick. Granted 1893.

£3 to Orkney.—*Secretary*, James Johnston, Orphir House, Orkney. Granted 1883.

£3 to East Mainland, Orkney.—*Convener*, Alfred Reid, Braebuster, Kirkwall; *Secretary*, John Cumming, Sebay, St Andrews, Orkney. Granted 1898

MEDALS IN AID OF PREMIUMS GIVEN BY LOCAL SOCIETIES.

The Society, being anxious to co-operate with local Associations, will give a limited number of Silver Medals annually to Societies, not on the list of Cattle, Horse, or Sheep Premiums, in addition to the Money Premiums awarded in the Districts for—

1. Best Bull, Cow, Heifer of any pure breed, or Ox.
2. Best Stallion, Mare, or Gelding.
3. Best Tup, or Pen of Ewes or Wethers.
4. Best Boar, Sow, or Pig.
5. Best Pens of Poultry.
6. Best Sample of any variety of Wool.
7. Best Sample of any variety of Seeds.
8. Best managed Farm.
9. Best managed Green Crop.
10. Best managed Hay Crop.
11. Best managed Dairy.
12. Best Sweet-Milk Cheese.
13. Best Cured Butter.
14. Best collection of Roots.
15. Best kept Fences.
16. Male Farm Servant who has been longest in the same service, and who has proved himself most efficient in his duties, and to have invariably treated the animals under his charge with kindness.
17. Female Servant in charge of Dairy and Poultry who has been longest in the same service, and who has proved herself most efficient in her duties, and to have invariably treated the animals under her charge with kindness.
18. Best Sheep-Shearer.
19. Most expert Hedge-Cutter.
20. Most expert Labourer at Draining.
21. Most expert Farm Servant at trial of Reaping-Machines.
22. Best Maker of Oat-Cakes.

It is left to the local Society to choose out of the foregoing list the classes for which the Medals are to be competed.

The Medals are granted for two years, and lapse if not awarded in those years.

In 1889 it was resolved that in future no Society shall receive more than two Medals for two years.

Aberdeenshire.

1. Deeside Union.—*Convener*, Lt.-Col. F. N. Innes, Learney, Torphins; *Secretary*, John Cooper, Ley, Banchory, Aberdeen. 2 Medals. 1898.
2. Ebrieside.—*Convener*, John Grant, Banker, Methlick; *Secretary*, William Johnston, Loanhead, Savoch, Ellon. 2 Medals. 1899.
3. Garioch.—*Convener*, Alex. M. Gordon of Newton, Insch; *Secretary*, George A Bruce, Inschfield, Insch. 2 Medals. 1899.
4. Kennethmont.—*Convener*, William A. Mitchell, Auchnagathel, Keig; *Secretary*, James R. Moir, 22 Belmont Road, Aberdeen. 2 Medals. 1898.
5. North of Scotland Root, Vegetable, &c.—*Convener*, John Maitland, East Balhalgardy, Inverurie; *Secretary*, Alex. Greig, Paradise, Inverurie. 4 Medals 1899.

Argyllshire.

6. NETHER LORN.—*Convener*, Allan Hall, Degnish, Easdale, Oban; *Secretary*, Peter Fisher, Kilbrandon, Oban. 2 Medals. 1898.

Ayrshire.

7. BEITH.—*Convener*, P. M'Kinnon Skeoch, Boydstone, Beith; *Secretary*, Matthew Gilmour, Clydesdale Bank, Beith. 2 Medals. 1898.
8. DALRY.—*Convener*, ; *Secretary*, James Allan, Blackstone, Dalry. 2 Medals. 1898.
9. DALRYMPLE.—*Convener*, ; *Secretary*, John Murchie, Netherton, Dalrymple. 2 Medals. 1899.
10. FENWICK.—*Convener*, James Dunlop of Gree, Fenwick; *Secretary*, James Dunlop, Midland, Fenwick. 2 Medals. 1899.
11. KILMAURS.—*Convener*, ; *Secretary*, James D. Brown, Woodhill, Kilmaurs. 2 Medals. 1899.

Dumbartonshire.

12. DUMBARTONSHIRE.—*Convener*, Thomas M'Laren, Main Street, Alexandria; *Secretary*, William Davie, Main Street, Alexandria. 2 Medals. 1899.

Dumfries-shire.

13. ESKDALE AND LIDDESDALE.—*Convener*, John W. J. Paterson, Terrona, Langholm; *Secretaries*, Stevenson and Johnstone, Langholm. 2 Medals. 1899.

Elginshire.

14. FORRES AND NORTHERN FAT CATTLE CLUB.—*Convener*, Robert Urquhart, jun., Forres; *Secretary*, Alex. Dunbar, Solicitor, Forres. 2 Medals. 1899.

Fifeshire.

15. BALLINGRY AND AUCHTERDERRAN.—*Convener*, ; *Secretary*, John Stewart, Lumphinnans Farm, Cowdenbeath. 2 Medals. 1899.
16. CUPAR AND NORTH OF FIFE.—*Convener*, Alex. Lawson of Burnturk, Kettle; *Secretary*, John Mitchell, Fliskmillan, Newburgh. 2 Medals. 1899.

Forfarshire.

17. ANGUS.—*Convener*, David Hume, Barrelwell, Brechin; *Secretary*, James Kydd, Arbroath 2 Medals. 1899.

Stewartry of Kirkcudbright.

18. CARSPHAIRN.—*Convener and Secretary*, Charles E. Stewart, Carsphairn, Galloway. 2 Medals. 1898.

Lanarkshire.

19. SHETTLESTON AND CHRYSTON.—*Convener*, Alex. Murdoch, Gartcraig, Shettleston; *Secretary*, John Watson, 24 St Vincent Place, Glasgow. 2 Medals. 1898.

Perthshire.

20. Atholl and Weem.—*Convener*, Alex. Robertson, Ballechin, Ballinluig ; *Secretary*, Hugh Mitchell, Pitlochry. 2 Medals. 1899.

21. Moulin.—*Convener and Secretary*, Robert M'Gillewie, Union Bank, Dunkeld. 1 Medal. 1898.

Renfrewshire.

22. Lochwinnoch.—*Convener*, John Pollock, jun., Springside, Howwood ; *Secretary*, Robert Reid, Solicitor, Lochwinnoch. 2 Medals. 1898.

23. Mearns.—*Convener*, Wm. Clark, Netherlee Farm, Cathcart ; *Secretary*, James Pollock, Union Bank, Barrhead. 2 Medals. 1899.

Ross-shire.

24. Easter Ross.—*Convener*, Thomas Urquhart of Delny, Delny Station ; *Secretary*, R. T. Stewart, Commercial Bank, Tain. 2 Medals. 1897. (In abeyance in 1897.)

Roxburghshire.

25. Liddesdale.—*Convener*, ; *Secretary*, Alex. Thomson, The Bank, Newcastleton. 2 Medals. 1899.

Applications from other Districts must be lodged with the Secretary of the Society *by* 1*st November next.*

RULES OF COMPETITION.

1. All Competitions must be at the instance of a local Society.

2. The classes for which Medals are granted must be in accordance with the list at page 58. The Committee shall select the classes, and specify them in the return.

3. A Committee of Management shall be appointed, and the Convener of the Committee must be a Member of the Highland and Agricultural Society.

4. The Money Premiums given in the District must be not less than £2 for each Medal claimed.

5. The Medal for Sheep-Shearing shall not be awarded unless there are three competitors, and it shall always accompany the highest Money Premium. There must not be fewer than two competitors in all the classes.

6. Blank reports will be furnished to all the Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary of the Highland and Agricultural Society *on or before the* 1*st of November next*, with the exception of green crop reports, which must be forwarded on or before the 20th of December, for the approval of the Directors, against whose decisions there shall be no appeal.

7. When a grant has expired, the District shall not be eligible to apply again for aid for two years ; and if no competition takes place in a District for two years, the grant shall expire.

PLOUGHING COMPETITIONS.

The Minor Silver Medal will be given to the winner of the first Premium at Ploughing Competitions, provided a Report in the following terms is made to the Secretary, within one month of the Competition, by a Member of the Society:—

FORM OF REPORT.

I, of , Member of the Highland and Agricultural Society, hereby certify that I attended the Ploughing Match of the Association at in the county of on the when ploughs competed; of land were assigned to each, and hours were allowed for the execution of the work. The sum of £ was awarded in the following proportions, viz.:—

[*Here enumerate the names and designations of successful Competitors.*]

RULES OF COMPETITION.

1. All Matches must be at the instance of a local Society or Ploughing Association, and no Match at the instance of an individual, or confined to the tenants of one estate, will be recognised.
2. The title of such Society or Association, together with the name and address of the Secretary, must be registered with the Secretary of the Highland and Agricultural Society, 3 George IV. Bridge, Edinburgh.
3. Not more than one Match in the same season can take place within the bounds of the same Society or Association.
4. All reports must be lodged within one month of the date of the Match, and certified by a Member of the Highland and Agricultural Society who was present at it.
5. A Member can only report one Match; and a Ploughman cannot carry more than three Medals in the same season.
6. To warrant the grant of the Medal there must have been twelve ploughs in Competition, and Three Pounds awarded in Premiums by the local Society. The Medal to be given to the winner of the first prize.
7. Ploughmen shall not be allowed any assistance, and their work must not be set up nor touched by others; attention should be given to the firmness and sufficiency of the work below more than to its neatness above the surface.
8. On land of average tenacity the ploughing must be at the rate of not less than an imperial acre in ten hours. *The Society's Medal will not be given where this condition is not complied with.*

CLASS III.

COTTAGES AND GARDENS.

The following Premiums are offered for Competition in the Parishes after mentioned.

The Premiums are granted for two years.

PREMIUMS FOR BEST KEPT COTTAGES AND GARDENS.

1. Best kept Cottage	£1 0 0
Second best	0 10 0
2. Best kept Cottage Garden	1 0 0
Second best	0 10 0

RULES OF COMPETITION.

1. Competitions may take place in the different parishes for Cottages and Gardens, or for either separately.

2. The occupiers of Lodges at Gentlemen's Approach Gates and Gardeners' Houses are excluded, as well as others whom the Committee consider, from their position, not to be entitled to compete. The inspection must be completed by the 1st of October. In making the inspection, the Conveners may take the assistance of any competent judges.

3. It is left to the Committee of the District to regulate the maximum annual rent of the Cottages, which may, with the garden, be from £5 to £7.

4. To warrant the award of full Premiums, there must not be fewer than three competitors in each class. If there are less than three competitors in each class, only half Premium will be awarded.

5. A person who has gained the highest Premium cannot compete again.

6. If the Cottage is occupied by the proprietor, the roof must be in good repair; if the roof is thatch, it must be in good repair, though in the occupation of a tenant. The interior and external conveniences must be clean and orderly; the windows must be free of broken glass, clean, and affording the means of ventilation. Dunghills, and all other nuisances, must be removed from the front and gables. In awarding the Cottage Premiums, preference will be given to Competitors who, in addition to the above requisites, have displayed the greatest taste in ornamenting the exterior of their houses, and the ground in front and at the gables.

7. In estimating the claims for the Garden Premiums, the judges should have in view—the sufficiency and neatness of the fences and walks; the cleanness of the ground; the quality and choice of the crops; and the general productiveness of the garden.

8. Reports, stating the number of Competitors, the names of successful parties, and the nature of the exertions which have been made by them, must be transmitted by the Conveners to the Secretary *on or before the* 1*st November next.*

9. When a grant has expired, the District cannot apply again for aid for two years.

Parishes desirous of these Premiums must lodge applications with the Secretary *on or before the* 1*st November next.*

MEDALS FOR COTTAGES AND GARDENS OR GARDEN PRODUCE AND BEE-KEEPING.

The Society will issue annually two Minor Silver Medals to a limited number of local Associations or individuals, who at their own expense establish Premiums for Cottages and Gardens under £15 of Rent. One of the Medals may be awarded for the best kept Cottage, and the other for the best kept Garden or Flower-Plot, or Garden Produce, the produce of the cottager's own garden. Two Minor Silver Medals will also be issued to Local Bee-Keeping Associations.

Local Associations or individuals desirous of these Medals, must lodge applications with the Secretary *on or before the* 1*st November next*.

The Medals are granted for two years.

Aberdeenshire.

1. DAVIOT.—*Convener*, James Durno, Eastertown, Old Meldrum; *Secretary*, J. R. Campbell, Daviot, Old Meldrum. 2 Medals. 1899.
2. KINELLAR.—*Convener*, George Bruce, Tochineal, Cullen; *Secretary*, Neil Smith, Blackburn, Kinaldie. 2 Medals. 1898.
3. TYRIE.—*Convener*, James Cruickshank, Ladysford, Fraserburgh; *Secretary*, James Merson, Cairnmourning, Boyndlie, Fraserburgh. 2 Medals. 1899.

Argyllshire.

4. MULL AND MORVERN.—*Convener*, ; *Secretary*, Donald Macrae, The Villa, Salen, Aros, Mull. 2 Medals. 1899.

Ayrshire.

5. DARVEL.—*Convener*, Alex. Steel, Burnhead, Darvel; *Secretary*, Matthew Mair, Auchenbart, Darvel. 2 Medals. 1899.
6. GALSTON.—*Convener*, J. Harling Turner, Kilmarnock; *Secretary*, Adam Young, M.A, The Schoolhouse, Galston. 2 Medals. 1898.

Berwickshire.

7 LAUDERDALE.—*Convener*, George L. Broomfield, Lauder; *Secretary*, John Scott, Lauder. 2 Medals. 1898.

Fifeshire.

8. FREUCHIE AND DISTRICT —*Convener*, Walter Ness, Freuchie; *Secretary*, William Allan, Freuchie. 2 Medals. 1899.

Kirkcudbrightshire.

9. URR.—*Convener*, Wellwood H. Maxwell of Munches, Dalbeattie; *Secretaries*, R. Slater, Hardgate, Dalbeattie, and S. Ewart, 1 Craignair Street, Dalbeattie. 2 Medals. 1898

Lanarkshire.

10. LAW.—*Convener*, ; *Secretary*, James Gilchrist, The Schoolhouse, Law, Carluke. 2 Medals. 1898.

Perthshire.

11. BLACKFORD.—*Convener*, George R Sharp, Bardrill, Blackford; *Secretary*, Albert Smith, Edina Villa, Blackford. 2 Medals. 1898.
12. BRACO.—*Convener*, ; *Secretary*, Wm. M'Ildowie, Croftbead, Braco. 2 Medals. 1899.
13. BREADALBANE, GLENLYON, WEEM, STRATHTAY, AND GRANDTULLY.—*Convener*, Peter Haggart, Aberfeldy; *Secretary*, A. Macpherson, Belleville, Aberfeldy. 2 Medals. 1898.

Renfrewshire.

14. Johnstone.—*Convener*, George L. Houston, of Johnstone, Johnstone; *Secretary*, James Robertson, Mayfield Place, Johnstone. 2 Medals. 1898.

15. Sir John Stirling Maxwell Gardens, &c.—*Convener*, Robert Dawson, Dovehill, Pollokshaws; *Secretary*, Samuel Johnston, 69 Harriet Street, Pollokshaws. 2 Medals. 1899.

Selkirkshire.

16. Galashiels.—*Convener*, A. Thomson, Galashiels; *Secretary*, John Smart, 34 Stirling Street, Galashiels. 2 Medals. 1898.

17. Selkirk.—*Convener*, William Edgar, Elmpark, Selkirk; *Secretary*, John MacAulay, The Glebe, Selkirk. 2 Medals. 1898.

Stirlingshire.

18. Airth, Bruce Castle, and Dunmore.—*Convener*, ; *Secretary*, John Gilchrist, Cuthrie, Larbert. 2 Medals. 1898.

19. Killearn.—*Convener*, David Wilson of Carbeth; *Secretary*, James Thomson, Post Office, Killearn. 2 Medals. 1899.

Wigtownshire.

20. Newton-Stewart, Minnigaff, and District.—*Convener*, ; *Secretary*, Alex. S. Morton, 13 Victoria Street, Newton-Stewart. 2 Medals. 1898.

REGULATIONS.

1. Competitions may take place in the different districts for Cottages and Gardens, or for either separately. The one Medal may be offered for Cottages, and the other for Gardens or Garden Produce, but the two cannot be given in one class.

2. The annual value of each Cottage, with the ground occupied in the parish by a Competitor, must not exceed £15. The occupiers of Lodges at Gentlemen's Approach Gates, and Gardeners in the employment of others, are not entitled to compete.

3. If Competition takes place for Garden Produce in place of the best kept Garden, such produce must be *bona fide* grown in the Exhibitor's Garden, and he will not be allowed to make up a collection from any other Garden.

4. To warrant the award of a Medal, there must not be fewer than three Competitors.

5. Blank reports will be furnished to the Secretaries of the different Districts. These must, in all details, be completed and lodged with the Secretary of the Highland and Agricultural Society *on or before the 1st November next*, for the approval of the Directors, against whose decisions there shall be no appeal.

6. When a grant has expired, the District cannot apply again for aid for two years, and if no competition takes place in a District for two years the grant expires.

Address for Telegrams—"SOCIETY," EDINBURGH.

Subject to Orders issued by the Board of Agriculture

HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

GENERAL SHOW OF STOCK AND IMPLEMENTS

IN

PRESTONFIELD GROUNDS, NEWINGTON,

EDINBURGH,

ON 4TH, 5TH, 6TH, AND 7TH JULY 1899.

LAST DAYS OF ENTRY.

IMPLEMENTS AND OTHER ARTICLES—Monday, 1st May.

STOCK, POULTRY, AND DAIRY PRODUCE—Monday, 29th May.

No Entry at ordinary fees taken later than those which are received at the Society's Office, Edinburgh, by first post, or 10 o'clock, on Monday morning (29th May). Post Entries for Cattle, Horses, Sheep, and Swine taken on payment of 10s. additional for each entry (Poultry at double fees) till Wednesday morning (31st May), at the Society's Office, Edinburgh, at 10 o'clock.

COVERED BOOTHS FOR OFFICES—Monday, 29th May.

President of the Society.

HIS ROYAL HIGHNESS THE PRINCE OF WALES.

Chairman of the Board of Directors.

SIR JOHN GILMOUR, BART.

Convener of the Local Committee.

SIR JAMES H. GIBSON-CRAIG, BART.

The District connected with the Show comprises the Counties of Edinburgh, Haddington, and Linlithgow.

REGULATIONS.

GENERAL CONDITIONS.

1. The Competition, except where otherwise stated, is open to Exhibitors from all parts of the United Kingdom.

2. Every Lot must be intimated by a Certificate of Entry, lodged with the Secretary *not later than Monday, 1st May, for Implements and other* *Entries.*

Articles, and Monday, 29th May, for Stock, Poultry, and Dairy Produce. No Entry taken at ordinary fees later than those which are received at the Society's Office by first post, or 10 o'clock, on Monday morning, 29th May. Post Entries for Cattle, Horses, Sheep, and Swine taken on payment of 10s. additional for each entry (Poultry at double fees) till Wednesday morning (31st May), at the Society's Office, Edinburgh, at 10 o'clock. Printed forms of Entry will be issued on application to the Secretary, No. 3 George IV. Bridge, Edinburgh. Admission Orders will be forwarded to Exhibitors, by post, previous to the Show.

Protests. 3. Protests against the awards of the Judges, or against a violation of the judging regulations, must be lodged with the Secretary, at his Office in the Showyard, not later than 9 A.M. on Wednesday, the second day of the Show, and parties must be in attendance at the Committee Room, in the Showyard, at 9.30 A.M. that day, when protests will be disposed of. All protests must be accompanied by a deposit of £2, 2s., and if not sustained the sum may be forfeited at the discretion of the Directors.

4. Protests lodged for causes which the protester produces no good evidence to substantiate will render him liable to be reported to the Board of Directors, with the view, if they see reason, of his being prohibited from again entering Stock for a General Show.

Society not liable. 5. The Society shall not be liable for any loss or damage which Stock, Poultry, Dairy Produce, Implements, or other articles may sustain at the Show, or in transit.

Rejecting Entries. 6. The Society reserves the right to reject or cancel any entry or prohibit the exhibition of any entry.

Decisions of Board. 7. The decisions of the Board of Directors are final in all questions respecting Premiums and all other matters connected with the Show, and it shall not be competent for any Exhibitor to appeal against such decisions to, nor seek redress in respect of them from, any other tribunal.

Covered Booths. 8. Covered Booths for Offices (9 feet by 9 feet), purely for business, not for exhibition of goods, can be had for £3, 10s. to Members and £5 to Non-Members. Intimation to be made to the Secretary on or before the 29th of May. Those applying after that date to pay double Entry Money, but no application can be received later than 16th June.

Lights and Smoking. 9. No lights allowed in the Yard at night, and Smoking is strictly prohibited within the Sheds. Those infringing this Rule shall be liable to a fine of 10s.

Water. 10. As the command of water in the Yard is limited, it is particularly requested that waste be avoided.

Subjection to Rules. 11. All persons admitted into the Showyard shall be subject to the Rules and Orders of the Directors.

Powers of Stewards. 12. The Stewards have power to enforce the Regulations of the Society in their different departments, and to bring to the notice of the Directors and Secretary any infringement thereof.

Attendants. 13. All persons in charge of Stock or other Exhibits shall be subject to the orders of the Secretary and Stewards.

Violation of Rules. 14. The violation by an Exhibitor of any one of the Regulations shall render him liable to the forfeiture of all Premiums awarded to him, or of such a portion as the Directors may ordain, and also liable to be disqualified from again, or for a certain number of years, exhibiting at the Shows of the Society; or to have his case otherwise disposed of as the Directors may determine.

Railway Passes. 15. Railway Certificates for Stock and Implements are issued to Exhibitors before the Show along with their Tickets of Admission.

Removal of Exhibits. 16. No animal or article can be withdrawn before the formal closing of the Show at 5 P.M. on Friday; Steam Engines not till 6 o'clock. Stock and Implements may remain in the Yard till Saturday afternoon.

Payment of Prizes. 17. The Premiums awarded, except those withheld till birth of calf or foal is certified, will be paid as soon after the Show as practicable, and, with the exception of the Tweeddale Gold Medal, Special Cups, and Medals, may be taken either in money or in plate.

STOCK AND POULTRY.

Admission of Stock.

18. Poultry and Stock will be admitted on Monday, the day before the opening of the Show, and, with the exception of Horses, must be in the Yard before 12 o'clock that night. Horses must be in before 8 o'clock on the morning of Tuesday, except those entered for Jumping only, regarding which special Regulations will be found beside the list of prizes for Jumping. Judging begins at 10 A.M. on Tuesday. Exhibited on Tuesday, Wednesday, Thursday, and Friday. Stock may be admitted on the Saturday preceding the Show, but only by sending two days' prior notice to the Secretary.

Former Winners.

19. An animal which has gained a first Premium at a General Show of the Society cannot again compete in the same class, notwithstanding any alteration in the heights stated for such class, but may be exhibited as Extra Stock.

No substitution of animals.

20. All animals, except calves, foals, and lambs shown with their dams, must be entered in the classes applicable to their ages, and cannot be withdrawn after entry, or other animals be substituted in their place.

One class only.

21. For prizes given by the Society, no animal shall be allowed to compete in more than one class; but this Rule does not apply to the Jumping and Driving Competitions.

Herd-books.

22. Shorthorn, Aberdeen-Angus, Galloway, and West Highland animals must be entered in the herd-books, or the Exhibitor must produce evidence that his animal is eligible to be entered therein.

Ownership

23. Stock must be *bona fide the property of* the Exhibitor on the last day of Entry.

24. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor. The Society shall have power at any time to call upon an Exhibitor to furnish proof of the correctness of any statement in his entry.

Particulars of entries.

25. The name of the Breeder, if known, must be given, and if the Breeder is not known, a declaration to that effect, signed by the Exhibitor, must be made on the Entry Schedule, and no pedigree will be entered in the Catalogue when the Breeder is unknown.

Entries disqualified.

26. Should it be proved to the satisfaction of the Directors that an animal has been entered under a false name, pedigree, or description, for the purpose of misleading the Directors or Judges as to its qualification or properties, or that information required in the Schedule and known or easily ascertained by the Exhibitor has been withheld, such animal may be disqualified either before or after a prize has been awarded to it, and the case may be reported to the Directors, in order that the Exhibitor may be disqualified from again competing at the Society's Shows, or his case otherwise disposed of as the Directors may determine.

27. When an animal has previously been disqualified by the decision of any Agricultural Association in the United Kingdom, such disqualification shall attach, if the Exhibitor, being aware of the disqualification, fail to state it, and the grounds thereof, in his entry, to enable the Directors to judge of its validity. Any person who is disqualified from exhibiting at any Show in the United Kingdom shall be prohibited from exhibiting at any General Show of the Society, unless with the special consent of the Board.

Height of Horses.

28. All Horses or Ponies entered in classes in which a particular height is stated shall before being judged be measured with their shoes on. No subsequent measuring or alteration of shoes will be permitted.

Overfeeding. 29. Breeding Stock must not be shown in an improper state of fatness, and the Judges are requested not to award Premiums to overfed animals; and no Cattle or Sheep which have been exhibited as Fat Stock at any Show are eligible to compete in the Breeding Classes for the Society's Prizes.

Parades. 30. Horses and Cattle must be paraded at the times stated in the Programme of the Show, and when required by the Stewards, and under their direction. In Parade, Horses must be ridden or led as provided in their respective classes. Prize and commended animals will receive two rosettes each, which must be attached to the head of the animal, one on each side. Attendants must be beside their animals *twenty minutes before the hour of Parade*, and be ready to proceed to the ring immediately on receiving the order of the Stewards. Infringement of this Rule, or failure of any attendant to obey the orders of the Society's officials, will render the Exhibitor liable to a fine of 20s. for each separate infringement or act of disobedience, and to the forfeiture of any or all of the Prizes awarded to him at this Show.

Responsibility of Exhibitors. 31. Exhibitors shall be answerable for all acts, whether committed by themselves, their servants, or others in charge of their Stock, and shall be responsible for the condition of their animals during the whole time they remain in the Showyard.

Moving from stalls. *Washing Cattle.* 32. No animal shall be taken out of its stall after 10 A.M. during the Show except by order of the Stewards, or with permission of the Secretary. Cattle shall not be taken out of their stalls to be washed after the Judging has been finished. Those infringing this Rule shall be liable to a fine of 10s.

Sires. 33. Aged Bulls and Stallions must have had produce, and, along with two-year-old Bulls, three-year-old Colts, and two-shear and aged Tups, have served within the year of the Show.

Cows. 34. All Cows must have had calves previous to the Show, and when exhibited they must either be in milk or in calf: if in milk, birth must have been within 9 months of the Show; if in calf, birth must be certified within 9 months after the Show. This Rule does not apply to animals in Family Groups. Ayrshire Heifers in calf must produce a calf within three months of the first day of the Show.

Family Groups. 35. Cows in Family Groups must have had calves previous to the Show, and when exhibited they must be either in milk or in calf. Two-year-old Heifers in Family Groups must be certified to have been served before the Show, except Highland Heifers, which need not be served till 3 years old.

Ayrshire Cows. 36. All Milk Cows of the Ayrshire breed must be in the Yard on the evening of Monday, the day before the opening of the Show, before 8 o'clock, and they will be inspected by the Veterinary Surgeon, or other official of the Society, between 7 and 9 o'clock, to see if they have been milked dry; and if not, they must be milked under his direction. After the judging, all Milk Cows must be milked morning and evening.

Tampering with animals. 37. Any artificial contrivance or device of any description found on or proved to have been used on an animal, either for preventing the flow of milk or for any other improper purpose, will disqualify that animal from being awarded a Premium, and the Owner of said animal shall be prohibited from again entering Stock for any of the Society's General Shows, for such a period as the Directors may see fit.

In-calf Heifers. 38. Two-year-old Heifers of the Shorthorn, Aberdeen-Angus, and Galloway breeds, and three-year-old Highland Heifers, must be in calf when exhibited, and the Premiums will be withheld till birth be certified, which must be within 9 months after the Show.

39. Animals of any age that have had a calf must be shown as Cows.

Mares. 40. A Mare entered in a class for "Mares with foal at foot" must have produced a foal after 1st January of the year of the Show, must have regularly nursed her own or another foal, and must have the foal with her in the Show. If the mare's own foal is alive it must be the foal shown with the mare. In the case of a Mare that has not foaled before the Show, or whose foal has died, she shall, if not in milk, be eligible without further entry to compete among the Yeld Mares. Agricultural Yeld Mares must produce a foal within 12 months from the first day of the Show. A Mare in a class for "Mares or Geldings" may or may not have had a foal in the year of the Show, but shall not have her foal exhibited with her, nor be in milk at the time of the show.

Calves and Foals. 41. With reference to Regulations 34 and 38, birth of at least a seven months' calf must be certified; and in regard to Regulation 40, birth of at least a nine months' foal; or in the case of death, a Veterinary Surgeon's certificate must be produced certifying that at the time of death the animal was so far advanced with calf or foal that if it had lived it would have produced a calf or foal, as required by Rules 34, 38, 40[illegible]d 41.

Concealing animals. 42. No rug shall be hung up so as to conceal any animal in a horse-box or stall, except with special permission of the Steward of that department.

Hunters. 43. In the classes for Hunters four years old and upwards the Judges are empowered to transfer to the proper classes horses which, in regard to weight-carrying, are in their opinion entered in the wrong classes.

Soundness of Horses. 44. Judges are particularly requested to satisfy themselves, as far as possible, regarding the soundness of all Horses before awarding the Prizes, and to avoid giving Prizes to animals showing symptoms of hereditary diseases. The Judges may consult the Society's Veterinary Surgeon if they deem it expedient. No protests on veterinary grounds will be received.

Ewes. 45. All Ewes must have reared lambs in the year of the Show; and Ewes of the Blackfaced and Cheviot breeds must be in milk, and have their lambs at foot.

Clipping. 46. Sheep must have been clipt bare after 1st December 1898, and the Judges are instructed to examine the fleeces of the Sheep selected for Prizes, and to cast those on which they find any of the former fleece. This Rule does not apply to Cheviot sheep.

Sows. 47. Sows must have reared pigs in the year of the Show or be in pig; and Pigs must belong to the same litter, and be uncut.

Poultry. 48. In Poultry the Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

Securing Cattle. 49. Bulls must be secured by nose-rings, with chains or ropes attached, or with strong halters and double ropes. All Cattle, other than Highland Cattle, must be tied in their stalls.

Feeding appliances. 50. Servants in charge of Stock must bring their own buckets or pails, and a piece of rope or sheep-net to carry their forage. Mangers, sheep and pig troughs, will be provided.

Accommodation for animals. 51. Loose-boxes will be provided for Stallions, three, two, and one year-old entire Colts; for one-year-old Fillies, and for Mares with foals at foot; closed-in stables for all the other Horses, and covered accommodation for the whole of the other Live Stock. Stalls (floored) for attendants on Cattle, Horses, and Sheep will be provided at same rates as those charged for Stock.

Fodder. 52. Five days' supply of straw, hay, grass, and tares will be provided free by the Society. Any additional fodder or other kinds of food required will be supplied at fixed prices in the Forage-yard. Any servant removing bedding from an adjoining stall will be fined in double the amount taken. Exhibitors may fetch their own cake or corn to the Yard, but not grass, tares, hay, or straw. Coops, food, and attendance for Poultry will be provided by the Society.

Removal. 53. Cattle, Sheep, Swine, or Poultry cannot be removed from the Yard till 5 P.M. on Friday, the last day of the Show, except on certificate by the Veterinary Surgeon employed by the Directors, countersigned by the Steward of the department and the Secretary.

Withdrawal of horses over night. 54. Horses may be withdrawn at the close of the Show on Tuesday, Wednesday, and Thursday, on a deposit of £5 for each animal, which shall be forfeited, along with any prize money it may have gained, if the animal is not brought back. They must return between 7 and 7.30 the following morning, and those not in before 8 shall forfeit 10s. Horse passes to be applied for at the Committee Room between 5 and 6 P.M. on Tuesday, and the deposit, unless forfeited in whole or in part, will be returned between 12.30 and 2.30 on Friday.

Order in removal. 55. When the Stock is leaving the Yard, no animal is to be moved till ordered by those in charge of clearing the Yard. Those transgressing this Rule shall be liable to a fine of 10s., and detained till all the other Stock is removed.

JUDGING STOCK AND POULTRY.

Opening Gates. 56. On Tuesday, the first day of the Show, no person will be admitted, except Servants in charge of Stock, till 8 A.M., when the Gates are opened to the public.

Judging. 57. The Judges will commence their inspection at 10 A.M. The spaces reserved for the Judging will be enclosed, and no encroachment shall be permitted.

Insufficient merit. 58. In no case shall a Premium be awarded unless the Judges deem the animals to have sufficient merit; and where only one or two lots are presented in a section, and the Judges consider them unworthy of the Premiums offered, it shall be in their power to award a lower prize, or to suggest the removal of any lot which appears to them unworthy of a place in the Yard.

Commendations. 59. In addition to the Premiums, the Judges are authorised to award three Commendations in each section, if the entries are numerous and the animals of sufficient merit. These Commendations consist of—Very Highly Commended, Highly Commended, and Commended.

Ayrshire Cows and Heifers. 60. Ayrshire Cows which have not calved before the Show, whether entered in the class for Cows in Milk or for Cows in Calf, shall be judged along with the Cows in Calf, and Ayrshire Cows or Heifers which have calved before the Show—in whichever of the two classes entered—shall be judged along with Cows in Milk.

Attending Members. 61. One Member of Committee and one or two Directors shall attend each section of the Judges. It will be their duty to bring the animals out to the Judges and to see that no obstruction is offered to them, and that the space reserved for them is not encroached upon; to ticket the prize animals; to send the Nos. of prize animals to the Award Lectern near the Secretary's office; to assist the Judges in completing their return of awards; and should any difficulty arise, to communicate with the Stewards or Secretary.

62. It shall not be competent for any Exhibitor, nor for his Factor or Land-Steward, to act as a Judge or attending Member in any class in which he is competing.

DAIRY PRODUCE.

63. Dairy Produce will be received in the Showyard on Monday, the day before the opening of the Show, and till 8 A.M. on Tuesday, the first day of the Show. Judged at 10 A.M. on Tuesday. Exhibited Tuesday, Wednesday, Thursday, and Friday.

64. Dairy Produce must have been made on the Exhibitor's farm this year. No Exhibitor shall show more than one lot in each class. No lot can be removed from the Yard till 5 P.M. on Friday, the last day of the Show. The Society undertakes no responsibility for the receipt or despatch of exhibits, nor for the loss of exhibits, nor for any injury they may sustain during the Show.

STALL RENT.

65. The following rates shall be paid by Exhibitors when making their Entries :—

	Members s.	Members d.	Non-Members. s.	Non-Members. d.
Stalls for Cattle, each	15	0	25	0
Boxes for Stallions over 12 hands, for 3 and 2 year-old Colts, and for Mares, over 12 hands, with Foal at foot	30	0	40	0
Boxes for one-year-old entire Colts, one year-old Fillies, Stallions, 12 hands and under, and Mares, 12 hands and under, with Foal at foot	20	0	30	0
Boxes for Geldings over 12 hands, or Mares, over 12 hands, without Foal at foot	25	0	35	0
Stalls for Geldings over 12 hands, or Mares, over 12 hands, without Foal at foot	20	0	30	0
Stalls for Geldings, 12 hands and under, or Mares, without Foal at foot, 12 hands and under	15	0	20	0
Shed Accommodation for Machines for driving competitions, each	5	0	10	0
Sheep or Swine, per pen	10	0	15	0
Wool, per entry	2	6	5	0
Poultry, each entry	2	0	3	0
Dairy Produce, each entry	4	0	6	0
Covered Booths for offices, 9 feet by 9 feet	70	0	100	0
Newspaper offices . . £2, 10s.				

Entries in more than one Class.—In the case of animals entered in more than one class, the entry fee shall be five shillings for each class after the first. This does not apply to the Jumping Competitions.

EXTRA STALL FOR ATTENDANTS.

66. Exhibitors of Stock shall be entitled to take an extra Stall or Box for the accommodation of their attendants, but they must state when making their Entry that the Stall or Box is to be used for that purpose, and remit rent, which is at the same rate as stated above for the particular class of stock.

IMPLEMENTS AND OTHER ARTICLES.

67. Implements will be received in the Yard from Tuesday, 27th June, *Admission.* till 5 o'clock on the afternoon of Monday, 3rd July. Exhibited Tuesday, Wednesday, Thursday, and Friday. The Schedule of Entry must be filled up so far as within the knowledge of the Exhibitor, and prices must be stated.

68. No Money Prizes or Medals, except when specially offered, will be *Premiums.* given by the Society for Implements of any kind.

69. Agricultural Implements, and Implements and collections of *Refusing Entries.* articles not Agricultural, will be received for Exhibition, but the Secretary is entitled to refuse Entries from dealers in articles not deemed worthy of Exhibition.

70. In order to encourage exhibits of Agricultural Implements from *Local Operatives.* operative Blacksmiths and Carpenters in the district of the Show, open space will be provided for these in some less prominent part of the Yard at a charge of 10s. for space 10 feet wide and 20 feet deep.

71. Implements will be entered in the following sections—viz., 1st, *Order of Implements.* Under Cover, for Agricultural Implements ; 2nd, Open, for Agricultural Implements ; 3rd, Exhibits not Implements of Husbandry, either under cover or open, as may be deemed necessary by the Secretary ; 4th, Motion Yard ; 5th, Open space for Agricultural Implements from operative

Blacksmiths and Carpenters in the district of the Show. Exhibitors must specify the space they require.

Articles not entered.

72. Every article to be exhibited must be entered on the Society's Entry Form. Any article not so entered that is taken to the Show is liable to be ordered out of, or removed from, the Showyard, or confiscated to the Society. Exhibitors infringing this rule are moreover liable to a fine of £1.

Selling by auction and noisy behaviour forbidden.

73. "Cheap-Jacks" are not admitted to the Showyard. The selling of goods by auction, shouting, and other behaviour calculated to annoy visitors or Exhibitors, are strictly forbidden. Exhibitors infringing this Regulation are liable to a fine of £1, and to have themselves and their goods ordered out of, or removed from, the Showyard, or to have their goods confiscated to the Society.

Placing Exhibits.
Removing Exhibits.

74. The articles of each Exhibitor must be all placed in one stand, except Implements in motion, and must not on any account extend beyond the allotted space. No article shall be moved out of its stand, or the stand dismantled, till the termination of the Show, at 5 P.M. on Friday. Those infringing this Rule shall be liable to a fine of 10s.

Restoring Turf.

75. When the ground requires to be broken, the turf must be carefully lifted and laid aside, and the surface must be restored to the satisfaction of the Society, and at the expense of the Exhibitor.

Arranging Exhibits.

76. Exhibitors must arrange their own articles *within* the space allotted to them before 9 o'clock on Tuesday, and to the satisfaction of the Stewards in charge of the Implement Yard.

Handbills.

77. Exhibitors are not allowed to distribute handbills anywhere in the Yard except at their own Stand; and they must not for this or any other purpose encroach upon the adjacent alleys or open spaces.

Sweeping Stands, &c.

78. Exhibitors are required to have their Stands and the portions of the alleys immediately adjoining them swept up before eight o'clock on each morning of the Show.

Fuel.

79. All Machines requiring steam or fire must be entered as such in the Certificate, and will be placed in the Motion Yard. *Coke only shall be used in all cases where fire is required after* 10 *o'clock* A.M. Those infringing this Rule shall incur a penalty of £5.

Steam Engines.

80. No Steam Engine shall be driven in the Yard at a greater speed than 4 miles an hour. Traction Engines shall not be used in conveying Exhibits or other goods into, from one place to another in, or out of the Showyard.

81. Locomotive and Traction Engines and other Machines must not be moved from their places without permission of the Secretary or Stewards, and must not leave their stands till 6 P.M. on Friday.

Consigning Implements.

82. There must be attached to each Implement, when forwarded to the Show, a label bearing the Exhibitor's name, and that of the Implement, as well as the number of the Exhibitor's stand.

83. The carriage of all Implements must be prepaid.

Exhibitors' and Attendants' Tickets.

84. Each Exhibitor in the Implement Department will receive one free Ticket of Admission to the Showyard for himself or a member of his firm, and will receive, in addition, for the use of attendants employed by him at his Stand, two Tickets of Admission for each complete ten feet of shedding in the Motion Yard, and one Ticket for each complete ten feet of shedding in the other sections. No additional Free Tickets can be issued in any circumstances whatever. Additional Attendants' Tickets, not more than five for any one Exhibitor, may be purchased at 5s. each.

Tickets to be filled up and signed.

85. The Tickets of Admission for Exhibitors and Attendants referred to in the foregoing Regulation will (about fourteen days prior to the Show) be issued to the Exhibitors in blank, with the number of the Exhibitor's Stand. The name of the person for whom each ticket is intended must be written on it before it is used. Each person holding a Free Ticket of Admission must sign his or her name on the back thereof, and must also,

when required, sign his or her name in the book at the Entrance Gate. Exhibitors' attendants are strictly cautioned not to lend or transfer their Tickets, which can be used only by the persons whose names they bear, and who must be *bona fide* acting for, or employed by, the Exhibitor. No Ticket is transferable. An Exhibitor is liable to a fine of £1 for each case of transfer or other improper use of a Ticket issued to himself or employee.

Tickets not Transferable.

Improper use of Tickets.

STALL RENT.

86. Ground to be taken in spaces of 10 feet frontage by 20 feet deep, except in Motion Yard, which is to be 10 feet or any larger amount of frontage by 50 feet deep.

87. Rates for space, payable by Exhibitors when making their Entries:—

	Members	Non Members.
Shedding, 20 feet deep, 7 feet high, per 10 feet .	£1 5 0	£1 15 0
Space without Shedding, 20 feet deep, per 10 feet .	1 5 0	1 15 0
Space in Motion Yard, without Shedding, 50 feet deep, per foot	0 5 0	0 8 0
And with Shedding, 20 feet deep, 10 feet high, per foot	0 7 0	0 10 0
Covered Booths for offices, 9 feet by 9 feet, each .	3 10 0	5 0 0
Newspaper offices, each . . £2, 10s.		

ADMISSION OF THE PUBLIC.

The public will be admitted daily at 8 A.M. Judging begins on Tuesday at 10 A.M. The charges for admission to the Yard will be—Tuesday, from 8 A.M. till 5 P.M., 5s. Wednesday, from 8 A.M. till 5 P.M., 3s.; from 5 P.M. till 8 P.M., 1s. Thursday, from 8 A.M. till 5 P.M., 2s.; from 5 P.M. till 8 P.M., 1s. Friday, from 8 A.M. till 5 P.M., 1s.

ADMISSION OF MEMBERS AND EXHIBITORS.

On exhibiting their "*Member's Ticket*," which is strictly not transferable, Members of the Society are admitted free to the Showyard and to the Enclosures and Stands around the Large Ring, excepting the Reserved Seats in the Grand Stand, and such other parts as may be reserved for any special purpose. Tickets will be sent to all Members residing in the United Kingdom whose addresses are known, and on no account will duplicates be issued. All Members not producing their tickets must pay at the gates, and the admission money will not on any account be returned.

Tickets of admission to the Showyard are sent to Exhibitors of Stock and Poultry (not Members) whose Entry Fees amount to not less than 10s.

For Exhibitors of Implements and their assistants tickets are issued as provided in the Regulations for Implements.

Tickets for attendants on Stock are not available to admit to the Yard between 11 A.M. and 5 P.M.; and any of these attendants requiring to leave the Yard during the day cannot be again admitted except by a special pass (to be applied for at the Ticket Gate), which must be given up on his return.

RESERVED SEATS IN GRAND STAND.

Reserved Seats in the Grand Stand (numbered).

For Charges, apply to Secretary.

VARIOUS.

Placards, except those of the Society, are prohibited both inside the Showyard and on the outside of the Boundary Fence, with the exception of those belonging to Exhibitors, whose right is confined to their own stalls. No newspapers or any other article allowed to be carried about the Yard for sale or display. No strolling bands or musicians admitted.

No Carriages or Equestrians admitted without special leave from the Directors, and then only for Invalids. Bath-chairs may be brought in.

Premium Lists, Regulations, and Certificates of Entry may be obtained by applying at the Secretary's Office, No. 3 George IV. Bridge, Edinburgh.

All Communications should be addressed to James Macdonald, Esq., *Secretary of the Highland and Agricultural Society of Scotland, No.* 3 *George IV. Bridge, Edinburgh.*

Address for Telegrams—"Society," Edinburgh.

LAST DAYS OF ENTRY.

Implements and other Articles—Monday, 1st May.

Stock, Poultry, and Dairy Produce—Monday, 29th May.

No Entry at ordinary fees taken later than those which are received at the Society's Office, Edinburgh, by first post, or 10 o'clock, on Monday morning (29th May). Post Entries for Cattle, Horses, Sheep, and Swine taken on payment of 10s. additional for each entry (Poultry at double fees) till Wednesday morning (31st May), at the Society's Office, Edinburgh, at 10 o'clock.

Covered Booths for Offices—Monday, 29th May.

RAILWAY ARRANGEMENTS.

The Railway Companies will be furnished with a list of the Exhibitors of Stock and Implements, after the 17th June, and all applications for horse-boxes and trucks, and for information as to arrangements of Special Trains, must be made by the Exhibitors themselves with the Stationmaster where their stock is to be trucked.

The arrangements made by the Railway Companies for the conveyance of Live Stock and Goods to and from the Show are **indicated** *below, but exhibitors are recommended to apply to the respective companies for* **full particulars**: -

1. Live Stock and Goods *to* the Show to be charged ordinary rates.

2. Live Stock and Goods *from* the Show, *if sold*, to be charged ordinary rates.

3. Live Stock and Goods *from* the Show, *if unsold*, to be carried at half rates back to the station whence they were sent, at owners' risk, on production of a certificate from the Exhibitor to the effect that they are unsold; failing production of such certificate, ordinary rates must be charged. The reduction to half rate is to be allowed only when the animals or goods are returned by the same route as that by which they were conveyed *to* the Show. The minimum charge for Stock returned at half rates is one-half the ordinary minimum.

If the unsold Live Stock which was carried on the outward journey by Passenger Train in horse-boxes be required to be returned by Goods Train in cattle trucks, half the Goods Train rates must be charged.

If the unsold Live Stock which was carried on the outward journey by Goods Train in cattle trucks be required to be returned by Passenger Train in horse-boxes, half the Passenger Train rates must be charged.

4. Horses and Cattle, when sent for exhibition from one Agricultural Show to another, in another part of the country, are charged the ordinary single rates in respect of each journey, from point to point, up to the last station to which they are sent for exhibition. If remaining unsold when returned from the latest Show to the originating or home station, they are—on production of the necessary certificates—charged half rates, provided such return journey is made by the line of the company by whose route it was conveyed on the outward

journey, or, where more than one company is concerned, by the same route as conveyed on the outward journey.

5. Unsold goods, previously carried by railway, transferred from one Agricultural Show to another, in another part of the country, will be conveyed at half rates at owners' risk, on production of certificate from the Exhibitor to the effect that they are unsold; failing production of such certificate, ordinary rates will be charged.

6. Poultry to be charged ordinary rates both ways.

7. Horse-boxes, or other Passenger Train vehicle, will not be provided for the carriage of Live Stock sent by Goods Train and invoiced at Goods Train rates. *For rates for Horse-boxes by Passenger and Special Trains, apply to the Railway Companies.*

8. Provender conveyed to Agricultural Shows with Live Stock will be charged ordinary rates, except so much of the same as may be required on the journey.

9. Men, certified by the owners to be *bona fide* in charge of Live Stock, to be conveyed free in the same train as the animals, as follows: One man for each consignment, except when the consignment requires more than one vehicle, when one man for each vehicle may be sent free; but no pass is given unless the charge for the consignment amounts to as much as the charge for one horse. When two or three horses forming one consignment are sent in the same horse-box, and a man is required to travel with each animal, the men may be conveyed free, provided each horse is charged at the single horse rate. Upon both the outward and homeward journeys a separate certificate and contract must be given, which must be retained by the stationmaster at the outward or homeward starting point, as the case may be.

10. The ordinary rates do not include delivery *to*, or collection *from*, the Show ground.

11. Agricultural Societies' Show Plant must be charged at Class C rates, station to station.

12. Tents, Canvas, and other articles carried to Shows, not for exhibition, to be charged the ordinary rates both going and returning.

DELIVERY CHARGES.

Rates of Cartage for Delivery or Collection of Live Stock, Implements, and other Articles between the Edinburgh Railway Station and the Showyard.

PRINCE OF WALES CHAMPION MEDALS

In commemoration of the visit of HIS ROYAL HIGHNESS THE PRINCE OF WALES, the Society offers a Champion Gold Medal, value £10, for the *best Animal or pen* in each of the following sections :—

1. Shorthorn.
2. Aberdeen-Angus.
3. Galloway.
4. Highland.
5. Ayrshire.
6. Jersey
7. Clydesdale Stallions.
8. Draught Geldings.
9. Clydesdale Mares and Fillies.
10. Hunter (Male).
11. Hunter (Female).
12. Hackney Stallions.
13. Hackney Mares and Fillies
14. Roadsters and Harness Horses
15. Ponies.
16. Shetland Ponies.
17. Blackfaced Sheep.
18. Cheviot.
19. Border Leicester.
20. Shropshire.
21. Half bred.
22. Oxford Down.
23. Suffolk.
24. Swine

NOTE.—*Animals entered as Extra Stock may compete for these Medals Former Winners of the President's Medals are eligible. The award of these Medals is not subject to the Rules as to calving and foaling. The Society shall have the right to photograph the Winners for publication in the 'Transactions'*

CATTLE

SHORTHORN.

Class		Premiums. 1st.	2nd.	3rd	4th
		£	£	£	£
	Tweeddale Gold Medal for best Shorthorn Bull—£20.				
1.	Bull calved before 1897 .	15	10	5	3
2.	Bull calved in 1897	15	10	5	3
3.	Bull calved in 1898 .	12	8	4	2
	Breeder of best Bull of any age in the three Classes—The Silver Medal.				
4.	Cow of any age .	12	8	1	2
5.	Heifer calved in 1897 . . .	10	5	3	2
6.	Heifer calved in 1898 . . .	10	5	3	2
	[1] Best Female of any age in the three Classes—£20.				
	Prince of Wales Gold Medal for best Shorthorn.				
	Carry forward	— —		— —	£158

ABERDEEN ANGUS.

[2] Two Silver Cups, each of the value of £50, for the best Bull of any age and for the best Cow of any age (Heifers excluded) in the Aberdeen-Angus cattle classes. These are to be Challenge Cups, and are to be known as the "Ballindalloch Challenge Cups." They are offered under the following conditions : 1. The Directors shall assume charge of the Cups, and shall frame such rules for their safety as they may decide upon. 2. Each Cup shall be held by the winner for one year as a Challenge Cup, and shall become the property of the exhibitor

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[1] Given by the Shorthorn Society.

[2] Given by the late Mr C Macpherson Grant of Drumduan

who shall win it five times, not necessarily in succession. 3. The Society shall, at their own expense, cause to be engraved on each Cup each year, the year, the place of the Show, name of successful exhibitor, name and herd-book number of the animal, and name of its breeder. 4. The Society shall award to the breeder of the successful animals a Silver Medal, bearing that he is the breeder of the winner of the "Ballindalloch Challenge Cup." 5. In every other respect the Cups shall be won according to regulations which the Directors may from time to time enact.

Brought forward £158

Class		Premiums. 1st. £	2nd. £	3rd. £	4th £	
7.	Bull calved before 1st Dec. 1896	15	10	5	3	
8.	Bull calved on or after 1st Dec. 1896	15	10	5	3	
9.	Bull calved on or after 1st Dec. 1897	12	8	4	2	
	[1] Champion Cup, value £50, for the best Bull of any age in the three Classes (see above).					
	Breeder of best Bull of any age in the three Classes—The Silver Medal.					
10.	Cow of any age	12	8	4	2	
	[1] Champion Cup, value £50, for the best Cow of any age in the above Class					
11.	Heifer calved on or after 1st Dec. 1896	10	5	3	2	
12.	Heifer calved on or after 1st Dec. 1897	10	5	3	2	
	[2] Champion Gold Medal for best animal of the breed in the foregoing Classes.					158
	Prince of Wales Gold Medal for best Aberdeen-Angus Animal.					

GALLOWAY.

Class		1st. £	2nd. £	3rd. £	4th £	
13.	Bull calved before 1897	15	10	5	3	
14.	Bull calved in 1897	15	10	5	3	
15.	Bull calved in 1898	12	8	4	2	
	[3] Best Bull in the three Classes—Cup, value £10, 10s.					
	Breeder of best Bull of any age in the three Classes—The Silver Medal.					
16.	Cow of any age	12	8	4	2	
17.	Heifer calved in 1897	10	5	3	2	
18.	Heifer calved in 1898	10	5	3	2	
	[3] Best Female in the three Classes—Cup, value £10, 10s.					
	Prince of Wales Gold Medal for best Galloway.					158

Carry forward ... £474

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[1] Given by the late Mr C. Macpherson Grant of Drumduan.
[2] Given by the Polled Cattle Society.
[3] Given by the Galloway Cattle Society.

			Premiums.			
	HIGHLAND.		1st.	2nd.	3rd.	
Class			£	£	£	
	Brought forward					£474
19.	Bull calved before 1897	15	10	5	3	
20.	Bull calved in 1897	15	10	5	3	
21.	Bull calved in 1898	12	8	4	2	
	Breeder of best Bull of any age in the three Classes—The Silver Medal.					
22.	Cow of any age	12	8	4	2	
23.	Heifer calved in 1896	10	5	3	2	
24.	Heifer calved in 1897	10	5	3	2	158
	Prince of Wales Gold Medal for best Highland Animal.					
25.	[1] Bullocks over two and not exceeding three years old, both sire and dam to be entered in the Highland Herd-Book—First Prize, £10, 10s.; Second Prize, £5, 5s.					
	AYRSHIRE.					
26.	Bull calved before 1897		12	8	4	
27.	Bull calved in 1897		12	8	4	
28.	Bull calved in 1898		8	5	3	
	Breeder of best Bull of any age in the three Classes—The Silver Medal.					
29.	Cow calved before 1896 in Milk		10	7	3	
30.	Cow calved in 1896 in Milk		10	7	3	
31.	Cow of any age in Calf, or Heifer calved in 1896 in Calf and due to calve within three months of the first day of the Show		10	7	3	
32.	Heifer calved in 1897		10	5	3	
33.	Heifer calved in 1898		8	5	3	158
	Prince of Wales Gold Medal for best Ayrshire.					
	[2] JERSEY.					
34.	Bull, any age		10	5	3	
35.	Cow, in Milk, calved before 1897		10	5	3	
36.	Cow in Milk, or Heifer in Calf, calved in 1897		10	5	3	
37.	Heifer calved in 1898		8	4	2	68
	Prince of Wales Gold Medal for best Jersey					
						£858

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[1] Given by Sir William Ogilvy Dalgleish, Bart

[2] Rule 36 applies to Jersey Cows

HORSES

FOR AGRICULTURAL PURPOSES.

CAWDOR CHALLENGE CUP, VALUE 50 GUINEAS, FOR BEST MARE.

Conditions of Competition.—This Cup is offered by the Clydesdale Horse Society of Great Britain and Ireland for the best Clydesdale Mare or Filly registered in the Clydesdale Stud-book, entered in any of the Draught Horse classes or as Extra Stock, former prize-winners being eligible to compete for the Cup. The Cup must be won three times by an exhibitor (but not necessarily in consecutive years or with the same animal) before it becomes his absolute property. The winner of the Cup, other than the absolute winner, shall, before delivery thereof is made to him, give security to the Clydesdale Horse Society that he shall surrender the same to the Society and deliver it at the Society's office when called upon to do so. Until the Cup be won outright, the winner of the Cup will receive the Clydesdale Horse Society's Silver Medal as a memento of his winning the Cup.

The Clydesdale Horse Society shall have the option of photographing the winner for publication in the Clydesdale Stud-book.

Class	DRAUGHT STALLIONS.	Premiums. 1st. £	2nd. £	3rd. £	4th. £	
38.	Stallion foaled before 1896	20	15	10	4	
39.	Entire Colt foaled in 1896	20	15	10	4	
40.	Entire Colt foaled in 1897	20	12	8	4	
41.	Entire Colt foaled in 1898	15	10	6	4	
						£177

42. Derby of 1899 for Yearling Colts. Prizes of £7, £4, £3, £2, and £1. Entries closed 10th December.

Breeder of best Male Animal of any age in the four Classes—The Silver Medal.

Prince of Wales Gold Medal for best Clydesdale Stallion.

	DRAUGHT GELDINGS.					
43.	Draught Gelding foaled before 1896	10	5	3	—	
44.	Draught Gelding foaled in 1896	6	4	3	—	
45.	Draught Gelding foaled in 1897	6	4	3	—	
						44

Prince of Wales Gold Medal for best Draught Gelding

	DRAUGHT MARES AND FILLIES.					
46.	Mare of any age, with Foal at foot	20	12	7	4	
47.	Yeld Mare foaled before 1896	12	9	6	4	
48.	Yeld Mare or Filly foaled in 1896	12	9	6	4	
					£105	
	Carry forward				£105	£221

No animal is allowed to compete in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Driving Classes, and that Yearling Clydesdale Colts and Fillies may compete both in the ordinary Classes and for the Derby Sweepstakes.

Brought forward £105 £221

Class	DRAUGHT MARES AND FILLIES—*contd.*	Premiums. 1st.	 2nd	 3rd.	 4th.		
		£	£	£	£		
49.	Filly foaled in 1897	12	9	6	4		
50.	Filly foaled in 1898	12	9	6	4	62	
51.	Derby of 1899 for Yearling Fillies. Prizes of £8, £6, £3, £2, and £1 Entries closed 10th December.						167
	Best Mare or Filly—Challenge Cup, value 50 guineas, as on page 79.						
	[1] Breeder of Best Clydesdale Brood Mare — The Robert Murdoch Prize, value £10.						
	Prince of Wales Gold Medal for best Clydesdale Mare or Filly.						

HUNTERS.

Class		1st.	2nd.	3rd.	4th.		
52.	Colt, Gelding or Filly, foaled in 1898, the produce of thorough-bred Stallions, out of Mares of any breed,—Five Prizes [2]—£10, £7, £5, £2, £1.						
53	Filly, Mare or Gelding, for field, foaled in 1897—*in hand*	12	8	4			
54.	Yeld Mare, Filly, or Gelding for field, foaled in 1896—*in hand*	20	10	5			
	[3] Best Hunter Filly in Classes 53 and 54—Gold Medal, value £10, 10s.					£59	
55.	Mare or Gelding, foaled in 1895, able to carry over 13 stone 7 lb.—*in saddle*	30	20	10	5		
56.	Mare or Gelding, foaled in 1895, able to carry from 12 stone to 13 stone 7 lb.—*in saddle*	30	15	8	4		
57.	Mare or Gelding, foaled before 1895, able to carry over 15 stone—*in saddle*	50	25	15	—		
58.	Mare or Gelding, foaled before 1895, able to carry from 13 stone 7 lb. to 15 stone—*in saddle*	50	20	10	5		
59.	Mare or Gelding, foaled before 1895, able to carry from 12 stone to 13 stone 7lb.—*in saddle*	[4] 40	15	8	4		
60	[5] Hunter Brood Mare, with foal at foot or to foal this season—£15, £8, £1.					364	
							423

Carry forward £811

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[1] Bequest by the late Miss Murdoch

[2] Given by Sir John Gilmour of Montrave, Bart.

[3] Given by Hunters' Improvement Society.

[4] Given by Joint Masters of Linlithgow and Stirlingshire Hunt.

[5] Given by Captain Clayhills Henderson of Invergowrie, R N.

Brought forward £811

HUNTERS—*continued.*

[1] Prizes of £10 and £5 for best and second best Hunter in any of the Hunter Classes, the property of a tenant farmer, and regularly hunted with any pack of foxhounds in Scotland in the season 1898 99 *

Prizes of £20 and £10 for best and second best Hunter in any of the Hunter Classes, the property of a tenant farmer, and regularly hunted with any pack of foxhounds in the United Kingdom in the season 1898 99 *

Prizes of £15 and £5 for best and second best Hunter of any age in any of the Hunter Classes regularly hunted by a lady with any pack of foxhounds in the United Kingdom in the season 1898 99.*

* A certificate must be furnished from the Master of the Pack to the effect that the animal has been hunted as provided The animal need not have been hunted by the exhibitor himself

[2] Champion Prize of £50 for the best Hunter in Classes 55, 56, 57, 58, and 59

[3] Special Prize of £20 for the best Hunter in Classes 55, 56, 57, 58, and 59, irrespective of the weight it can carry, the winner of the £50 Champion Prize excluded.

Prince of Wales Gold Medal for best Hunter, Colt or Gelding
Prince of Wales Gold Medal for best Hunter, Mare or Filly

In addition to the individual contributions noted, the sum of £250 has been contributed towards the prizes for Hunters, per Sir James H Gibson Craig, Mr A H Johnstone Douglas, and Mr James Wylie

Class	HACKNEYS.	Premiums 1st. £	2nd £	3rd £	
	(All to be shown in hand.)				
61.	Brood Mare, 15 hands and upwards, with Foal at foot, or to foal this season to a registered Sire .	15	10	5	
62	Brood Mare, under 15 hands, with Foal at foot, or to foal this season to a registered Sire .	15	10	5	
63.	Yeld Mare or Filly, foaled in 1896 .	14	8	4	
64	Filly, foaled in 1897 . .	12	7	4	
65	Filly, foaled in 1898 .	12	7	4	
	Prince of Wales Gold Medal for best Female Hackney in Classes 61 to 65				132
66	Stallion, foaled in or before 1896, over 15 hands . .	20	10	5	
67.	Stallion, foaled in or before 1896, over 14 and not over 15 hands .	20	10	5	
					70

Carry forward £202 £811

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[1] Given by Mr James Hope East Barns
[2] Given by Mid Lothian County Club
[3] Given by Mr Fred Usher, Norton Mains.

Brought forward £202 £811

HACKNEYS—*continued.*

Class	Premiums. 1st. £	2nd. £	3rd. £		
68. Entire Colt, foaled in 1897	15	8	4		
69. Entire Colt, foaled in 1898	12	7	4		
				50	

All animals entered in the above Classes must be registered in the Hackney Stud-book except in Classes 65 and 69, and animals entered in Classes 65 and 69 must be eligible for entry in the Hackney Stud-book.

[1] Gold Medal value £10 by Hackney Horse Society for best Stallion or Colt in Hackney or Pony Classes.

[1] Gold Medal value £10 by Hackney Horse Society for best Mare or Filly in Hackney or Pony Classes.

Prince of Wales Gold Medal for best Male Hackney in Classes 66 *to* 69.

The sum of £62 has been contributed towards these Prizes by Scotch breeders of Hackneys, per Mr John M. Martin. —— 252

ROADSTERS.

Class	1st. £	2nd. £	3rd. £		
70. Roadster, Mare or Gelding, foaled before 1896, 15 hands and upwards—*in saddle*	10	5	3		
71. Roadster, Mare or Gelding, foaled before 1896, 14.2 and under 15 hands—*in saddle*	10	5	3		
					36

Prince of Wales Gold Medal for best animal in the Classes for Roadsters (70, 71) *and for Horses in Harness* (81, 82).

PONIES.

Class	1st. £	2nd. £	3rd. £		
72. Stallion, 3 years old and upwards, over 12, not exceeding 14 hands—*in hand*	5	3	2		
73. Yeld Mare, Filly or Gelding, 3 years old and upwards, over 13 and not over 14½ hands—*in saddle*	5	3	2		
				£20	

Carry forward £20 £1099

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[1] A Mare 6 years old or more must have had a living foal. Winners of the Hackney Society's Gold Medals in 1899, except at the London and Royal English Shows, excluded. The winner must be entered or accepted for entry in Hackney Stud-book, and certified free from hereditary disease. The Gold Medal being of the intrinsic value of £10, that amount will be paid by the Hackney Horse Society at any time if the Medal be returned in good condition.

No animal is allowed to compete in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Driving Classes, and that Yearling Clydesdale Colts and Fillies may compete both in the ordinary Classes and for the Derby Sweepstakes.

Class		Premiums. 1st. £	2nd. £	3rd. £		
	Brought forward				£20	£1099
	PONIES—*continued.*					
74.	Yeld Mare, Filly or Gelding, 3 years old and upwards, over 12 and not over 13 hands—*in saddle*	5	3	2		
75.	Stallion, 3 years old and upwards, 12 hands and under—*in hand* .	5	3	2		
76	Yeld Mare, Filly or Gelding, 3 years old and upwards, 12 hands and under—*in saddle* . .	5	3	2		
	Prince of Wales Gold Medal for best Pony.				30	
					—	50
	SHETLAND PONIES. *(All to be shown in hand.)*					
77.	Stallion, not exceeding 10½ hands, foaled before 1895 . .	5	3	2		
78.	Mare, not exceeding 10½ hands, with foal at foot . . .	5	3	2		
79.	Yeld Mare, Filly or Gelding, not exceeding 10½ hands, foaled before 1896 . . .	5	3	2		
80	Colt, Gelding, Mare, or Filly, foaled in 1897 or 1898, not exceeding 10½ hands . . .	5	3	2		
	Prince of Wales Gold Medal for best Shetland Pony.					40
	DRIVING COMPETITIONS.					
81.	Yeld Mare, Filly or Gelding, in Harness, 15 hands and upwards, to be driven in the ring . .	10	5	3		
82.	Yeld Mare, Filly or Gelding, in Harness, under 15 hands, to be driven in the ring . .	10	5	3		
	[1] Best Pony, under 12 hands, in Harness, in Class 82—£10.					36
	[2] *Prince of Wales Gold Medal for best animal in the Classes for Roadsters (70, 71) and for Horses in Harness (81, 82)*					£1225

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[1] Given by Captain Dundas.

[2] *An animal that has won a Prince of Wales Gold Medal in any of the preceding Sections will not be eligible to again compete for the Medal in this Section.*

No animal is allowed to compete in more than one Class, except that horses entered in other Classes may also compete in the Jumping and Driving Classes, and that Yearling Clydesdale Colts and Fillies may compete both in the ordinary Classes and for the Derby Sweepstakes.

JUMPING COMPETITIONS—*See page* 86.

SHEEP

BLACKFACED.

Class		Premiums. 1st. £	2nd. £	3rd. £	4th. £	
83.	[1] Tup above two shear—£12, £8, £4.					
84.	Two shear Tup	12	8	4	2	
85.	Shearling Tup	12	8	4	2	
86.	Ewe above one shear, with her Lamb at foot	10	5	2	—	
87.	Shearling Ewe or Gimmer	10	5	2	—	
						£86

[2] The Breeders' Prize of £20 for the best five Blackfaced Tups, any age, bred by Exhibitor, and never away from or out of the Breeder's possession, shown in above Classes.

[2] Prizes of £4, £2, and £1 to the Shepherds in charge of the Prize-winners in Classes 83, 84, 85, 86, and 87.

Prince of Wales Gold Medal for best pen of Blackfaced Sheep.

CHEVIOT.

88.	Tup above one shear	12	8	4	2	
89.	Shearling Tup	12	8	4	2	
90.	Ewe above one shear, with her Lamb at foot	10	5	2	-	
91.	Shearling Ewe or Gimmer	10	5	2	—	
						86

[3] Best pen of Cheviot Sheep in above Classes, £10

Prince of Wales Gold Medal for best pen of Cheviot Sheep

BORDER LEICESTER.

92.	Tup above one shear	12	8	4	2	
93.	Shearling Tup	12	8	4	2	
94.	Ewe above one shear	10	5	2	—	
95.	Shearling Ewe or Gimmer	10	5	2	—	
						86

Prince of Wales Gold Medal for best pen of Border Leicesters

HALF-BRED.

96.	Tup above one shear	12	8	4	2	
97.	Shearling Tup	12	8	4	2	
98.	Ewe above one shear	10	5	2	—	
99.	Shearling Ewe or Gimmer	10	5	2	—	
						86

[4] Best Half-bred Tup in above Classes, £5.

[4] Best Half-bred Ewe or Gimmer in above Classes, £5.

Prince of Wales Gold Medal for best pen of Half Breds.

Carry forward .. £344

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[1] Given by Mr D. T. Martin of Girgenti

[2] Given by Mr C. Howatson of Glenbuck.

[3] Given by Cheviot Breeders, per Mr J. A. Borthwick

[4] Given by Breeders, per Mr John Bertram.

Brought forward £344

Class	SHROPSHIRE.	Premiums. 1st. £	2nd. £	3rd. £	
100.	Tup above one shear	6	4	2	
101.	Shearling Tup	6	4	2	
102.	Ewe above one shear	5	3	2	
103.	Shearling Ewe or Gimmer	5	3	2	
104.	[1] Pen of five Shearling Rams—£10.				44
	Prince of Wales Gold Medal for best pen of Shropshires.				
	OXFORD-DOWNS.				
105.	Shearling Tup	6	4	2	
106.	Shearling Ewe or Gimmer	5	3	2	
					22
	Prince of Wales Gold Medal for best pen of Oxford Downs.				
	SUFFOLK.				
107.	Shearling Tup	6	4	2	
108.	Shearling Ewe or Gimmer	5	3	2	
109.	[2] Three Ewe Lambs—£5, £3, and £2.				22
	Prince of Wales Gold Medal for best pen of Suffolk Sheep				
	EXTRA SECTIONS.				
110.	Three Blackfaced Wethers, one shear	5	3	—	
111.	Three Cheviot Wethers, one shear	5	3	—	
112.	Three Shearling Wethers, any cross out of Blackfaced Ewes	5	3	—	
113.	Five Fat Lambs, any breed or cross	5	3	—	
					32

[3] Best pen of Lambs in Class 113 got by a Suffolk Tup, and out of Cheviot or Blackfaced Ewes, £5.

[2] Best pen of Lambs in Class 113 got by a Suffolk Tup and out of Border Leicester, Half-bred, or Three-parts-bred ewes, £5.

[1] Best pens of Cross-bred Lambs in Class 113 got by a Shropshire Tup—£6, £4, and £2.

[4] Best pens of Cross-bred Lambs in Class 113 got by an Oxford-Down Tup £5, £3, and £2.

[5] Prizes of £4, £2, and £1 to the Shepherds in charge of the Prize-winners in Class 110.

£464

WOOL.

114. [6] Blackface Wether Wool, five fleeces—£3, £2, £1.
115. [6] Blackface Ewe Wool, five fleeces—£3, £2, £1.
116. [6] Blackface Ewe or Wether Hogg Wool, five fleeces—£3, £2, £1.

Note.—All fleeces must be white, unwashed, and shorn from sheep bred and reared on, or regular stock of, the Exhibitor's farm.

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[1] Given by Shropshire Sheep Breeders' Association.
[2] Given by the Suffolk Sheep Society.
[3] Given by Scotch Breeders, per Mr David Buttar.
[4] Given by Oxford-Down Sheep Breeders' Association.
[5] Given by Mr C. Howatson of Glenbuck.
[6] Given by Sir Robert Menzies, Bart.

SWINE

Class		Premiums. 1st. £	2nd. £	
	LARGE WHITE BREED.			
117.	Boar	5	3	
118	Sow	5	3	
119.	Three Pigs, not above 8 months old .	4	2	
				22
	WHITE BREED OTHER THAN LARGE			
120.	Boar	5	3	
121	Sow	5	3	
122.	Three Pigs, not above 8 months old	4	2	
				22
	BERKSHIRE			
123.	Boar	5	3	
124	Sow .	5	3	
125	Three Pigs, not above 8 months old	4	2	
	Prince of Wales Gold Medal for best pen of Swine			22
				£66

JUMPING COMPETITIONS

SPECIAL REGULATIONS

(*See also the Regulations on pages* 65 *to* 75)

1. Jumping Competitions will take place on the afternoons of Wednesday, Thursday, and Friday, the 5th, 6th and 7th July
2 *Entries* for each day's Competitions will close at the Secretary's Office in the Showyard at 6 P M on the preceding day
3. *Entry Fees* —For classes for Horses—Wednesday, £1; Thursday and Friday, 10s for each class Pony classes—Wednesday, 10s , Thursday and Friday 5s for each class
4 An animal that wins a prize in the Open Class cannot compete in the Pony Class or *vice versa*
5 *Accommodation* for jumping horses will be provided as follows —Covered shed in which to stand during the day free of charge ; or, on application to the Secretary not less than seven days before the opening of the Show, stalls or loose boxes will be provided at a charge (in addition to the Entry Fee) of £1 for a stall, and £1, 10s for a loose box, which must be paid along with the Entry Fee at the time of application
6. Horses entered for jumping only need not enter the Showyard till 10 A M on the day of Competition, and may leave the Showyard at 6 P M each day.
7 *The Jumps* may consist of Single Hurdle, Gate, Double Hurdle, Wall, and Water Jump, power being reserved by the Society to alter these, as well as the Handicaps, as may be thought desirable

WEDNESDAY.

Class		1st £	2nd £	3rd £
1.	Horses—open . .	20	10	5
2	Ponies, 14 3 hands and under	10	5	3
	Carry forward	30	15	8

THURSDAY.

Class	1st. £	2nd. £	3rd. £	
Brought forward	30	15	8	
3. Horses, Open Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in Class 1	10	6	3	
4. Ponies, 14.3 hands or under, Handicap, hurdles and gate being raised 4 inches for first prize winner in Class 2	5	3	1	

FRIDAY.

Class	1st. £	2nd. £	3rd. £	
5. Horses, Open Handicap, hurdles and gate being raised 8 inches for the winner of the first prize, and 4 inches for the winner of the second prize in either of Classes 1 or 3—4 inches extra for the winner of the two first prizes in Classes 1 and 3	10	6	3	
6. Ponies, 14.3 hands or under, Handicap, hurdles and gate being raised 4 inches for the winner of the first prize in Class 2 or in Class 4, and 8 inches for winner of the first prize in both these Classes	5	3	1	
Champion Prize for most points in Prizes with one or more horses in above Classes—First Prize to count three points; Second Prize, two points; and Third Prize, one point. The money to be evenly divided in the event of a tie . .	10	0	0	
				£119

EXTRA STOCK

Animals not included in the Classes for Competition may be exhibited as Extra Stock, and may receive Awards as follows:—Very Highly Commended, or Highly Commended, carrying the Medium Silver Medal, or Commended, for which the Bronze Medal is given.

Animals entered as Extra Stock are eligible to compete for the Prince of Wales Gold Medals, whether former winners of the President's Medals or not.

POULTRY

First Premium—ONE SOVEREIGN; *Second Premium*—TEN SHILLINGS. In each Class in which there are six or more entries, a Third Prize of Five Shillings may be awarded, provided there is sufficient merit in the pens. Three or more Commendations may also be given; thus, Very Highly Commended, Highly Commended, and Commended.

Champion Medals—Six Prince of Wales Silver Medals are offered as follows:—

1. Best Cock, any Variety.
2. Best Hen, any Variety.
3. Best Cockerel, any Variety.
4. Best Pullet, any Variety.
5. Best Pen of Ducks.
6. Best Pen of Geese.
7. Best Pen of Turkeys

Aged Birds must have been hatched previous to, and Cockerels and Pullets in, the year of the Show.

	Class	
DORKING—		
Coloured	1	Cock
	2	Hen
	3	Cockerel
	4	Pullet
Silver Grey	5	Cock
	6	Hen
	7	Cockerel
	8	Pullet
COCHIN CHINA	9	Cock
	10	Hen
BRAHMAPOOTRA	11	Cock
	12	Hen
BRAHMA or COCHIN	13	Cockerel
	14	Pullet
SCOTCH GREY	15	Cock
	16	Hen
	17	Cockerel
	18	Pullet
HAMBURG—		
Black	19	Cock
	20	Hen
Any other Variety	21	Cock
	22	Hen
Any Variety	23	Cockerel
	24	Pullet
PLYMOUTH ROCK	25	Cock
	26	Hen
	27	Cockerel
	28	Pullet
MINORCA	29	Cock
	30	Hen
	31	Cockerel
	32	Pullet
LEGHORN—		
White	33	Cock
	34	Hen
Any other Variety	35	Cock
	36	Hen
Any Variety	37	Cockerel
	38	Pullet
LANGSHAN	39	Cock
	40	Hen
ORPINGTON	41	Cock
	42	Hen
LANGSHAN or ORPINGTON	43	Cockerel
	44	Pullet
WYANDOTTE—		
Gold or Silver	45	Cock
	46	Hen

	Class	
WYANDOTTE—		
Any other Variety	47	Cock
	48	Hen
Any Variety	49.	Cockerel
	50	Pullet
GAME—		
Old English	51	Cock
	52	Hen
Indian .	53	Cock
	54	Hen
Modern .	55	Cock
	56	Hen
Any Variety, including Old English and Indian	57	Cockerel
	58	Pullet
BANTAM—		
Game, any Variety, including Old English and Indian	59	Cock
	60	Hen
Any other Variety Bantam	61	Cock
	62	Hen
ANY OTHER RECOGNISED BREED OF POULTRY	63	Cock
	64	Hen
	65	Cockerel
	66	Pullet
DUCKS		
Aylesbury	67	Drake
	68	Duck
	69	Drake (Young)
	70	Duck (Young)
Rouen	71	Drake
	72	Duck
Any other Variety	73	Drake
	74	Duck
Any Breed (Aylesbury excepted)	75	Drake (Young)
	76	Duck (Young)
GEESE	77	Gander
	78	Goose
TURKEYS	79	Cock
	80	Hen

Amount of Poultry Premiums, £140

DAIRY PRODUCE

No Exhibitor to show more than one lot in any Class.

Class	Premiums. 1st. £	2nd. £	3rd. £	
1. Cured Butter, not less than 7 lb.	4	2	1	
2. Powdered Butter, not less than 7 lb.	4	2	1	
3. Fresh Butter, three 1-lb. rolls	4	2	1	
				£21

BUTTER-MAKING COMPETITIONS

Class 1.—Prizes of £5, £4, £3, £2, and £1. Open to all comers.

Class 2.—Prizes of £3, £2, and £1.

Class 3.—Prizes of £3, £2, and £1.

The Prince of Wales Silver Medal will be given with the First Prize in each Class.

The Prizes for Classes 2 and 3 are given by the Technical Education Committee of the Mid-Lothian County Council. These two Classes—2 and 3—are confined to pupils of Miss Ridley, Dairy Instructress to the County Council of Mid-Lothian, who have received Certificates: Class 2 being for Pupils who have not obtained a Prize at any former Competition, and Class 3 for previous Prize-winners. Prize-takers in Class 2 eligible to compete in Class 3.

Entries for all three Classes close on Monday, 29th May, and must be made on printed form, to be had from the Secretary. Entry-fee for Class 1—2s. 6d. No entry-money for Classes 2 and 3.

Information as to the days and hours for the different Competitions will be sent to the Competitors at least ten days before the opening of the Show.

EXHIBITION TRIAL OF OIL-ENGINES

An Exhibition of Oil-Engines at Work will be held in the Showyard. Entries close on Monday, 29th May.

Entry Form, with Regulations, may be had from the Secretary.

EXHIBITION TRIAL OF MANURE-DISTRIBUTORS

An Exhibition Trial of Machines for Distributing Artificial Manures will be held in the Edinburgh District in the month of July—date and place to be afterwards fixed. Entries close on Monday, 29th May.

Entry Form, with Regulations, may be had from the Secretary.

ABSTRACT OF PREMIUMS.

GIVEN BY THE SOCIETY.

1. Prince of Wales Gold Medals (24—about)	£265	0	0
2. Cattle	858	0	0
3. Horses	1225	0	0
4. Jumping	119	0	0
5. Sheep	464	0	0
6. Swine	66	0	0
7. Poultry	140	0	0
8. Dairy Produce	21	0	0
9. Butter-making Competition	15	0	0
10. Medals to Breeders, &c.	20	0	0
	£3193	0	0
Less—Amount contributed, as below, for Hackney Horses £62; for Hunters £240	302	0	0
	£2891	0	0

CONTRIBUTED PRIZES.

1. The Shorthorn Society	£20	0	0			
2. The late Mr C. Macpherson Grant of Drumduan,—Cups	100	0	0			
3. Polled Cattle Society	10	0	0			
4. Galloway Cattle Society	21	0	0			
5. Sir Wm. Ogilvy Dalgleish, Bart.	15	15	0			
6. Cawdor Challenge Cup	52	10	0			
7. Bequest by late Miss Murdoch	10	0	0			
8 Derby Stakes for Clydesdale Colts and Fillies	27	0	0			
9. Sir John Gilmour, Bart.	25	0	0			
10. Captain Clayhills Henderson	27	0	0			
11. Mid-Lothian County Club	50	0	0			
12 Masters of Linlithgow and Stirlingshire Hunt	40	0	0			
13. Mr Fred Usher	20	0	0			
14. For Hunter Prizes—per Sir James H Gibson Craig	250	0	0			
15. Mr James Hope	15	0	0			
16. Hunters' Improvement Society	10	10	0			
17. Scotch Hackney Breeders	62	0	0			
18. Hackney Horse Society	20	0	0			
19. Captain Dundas	10	0	0			
20. Breeders of Cheviot Sheep	10	0	0			
21. Breeders of Half bred Sheep	10	0	0			
22 Shropshire Sheep Breeder's Association	10	0	0			
23. Scotch Breeders of Shropshire Sheep	12	0	0			
24. Oxford-Down Sheep Breeder's Association	10	0	0			
25 Mr D. T Martin	24	0	0			
26 Mr C. Howatson	34	0	0			
27. Suffolk Sheep Society	20	0	0			
28. Sir Robert Menzies, Bart	18	0	0			
29. Tweeddale Gold Medal	20	0	0			
				953	15	0
				£3844	15	0

3 GEORGE IV BRIDGE,
EDINBURGH, *February* 1899

JAMES MACDONALD, *Secretary*

The General Show of Stock and Implements for 1900 will be held at Stirling on the 17th, 18th, 19th, and 20th July.

APPENDIX (B)

LIST OF MEMBERS

OF

THE HIGHLAND AND AGRICULTURAL SOCIETY OF SCOTLAND

ARRANGED ACCORDING TO COUNTIES
AND SHOW DISTRICTS

1899

By the Charter of 1834 the Society consists of two classes, Ordinary and Honorary or Corresponding Members. The number of Honorary or Corresponding Members resident in the United Kingdom must not exceed twenty, but with power to the Society to elect as Honorary Associates persons resident abroad, not subjects of her Majesty, who may have been benefactors to the Society, or who are distinguished for their skill in Art or Science, provided that the number of such Foreign Associates shall not exceed twenty.

By a Bye-law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected free Life Members of the Society.

Candidates for admission to the Society must be proposed by a Member, and are elected at the half-yearly General Meetings in January, and June or July. It is not necessary that the proposer should attend the meeting.

The Ordinary Annual Subscription is £1, 3s. 6d., and the Ordinary Subscription for Life-Membership is £12, 12s.; or, after ten annual payments have been made, £7, 7s. Proprietors farming the whole of their own lands, whose Rental on the Valuation Roll does not exceed £500 per annum, and all Tenant Farmers, Secretaries or Treasurers of Local Agricultural Associations, Factors Resident on Estates, Land Stewards, Foresters, Agricultural Implement Makers, and Veterinary Surgeons, none of them being also owners of land to an extent exceeding £500 per annum, are admitted on a subscription of 10s. annually, which may be redeemed by one payment of £5, 5s., or, after ten annual payments have been made, by one payment of £3, 3s. Subscriptions are payable on election, and afterwards annually in January.

According to the Charter, "Any person elected an Ordinary Member of the Society who shall not have objected to his election, on the same being intimated to him by the Secretary, shall not be entitled to resign or withdraw his name as a Member of the Society, unless he shall have paid up his Life Subscription, or shall have previously settled and paid in Annual Contributions a sum equal to that fixed by the Society at the time of his election, to be paid by Members as the purchase of a Life Subscription in lieu and in redemption of the Annual Payments." The Life Subscription for a Member paying £1, 3s. 6d. is £12, 12s., and for a Member paying 10s., £5, 5s.

Members having Candidates to propose are requested to state whether the Candidate should be on the £1, 3s. 6d. or 10s. list.

Members of the Society receive the 'Transactions' free on application, and are entitled to consult the Chemist and Botanist at reduced rates—to apply for District Premiums—to report Ploughing Matches for the Medal—to free admission to the Showyard, and to exhibit Stock and Implements at reduced rates. Firms are not admitted as Members, but if one partner of a firm becomes a Member, the firm is allowed to exhibit at Members' rates.

Members having Candidates to propose are requested to send their names to JAMES MACDONALD, Esq., 3 George IV. Bridge, Edinburgh.

By a Resolution of the Directors, 2nd February 1887, the list of Members, arranged according to Counties, has been so made up that no Member shall vote in more than one Show District for the nomination of Directors. Members finding any mistakes are requested to report the same to James Macdonald, Esq., 3 George IV. Bridge, Edinburgh.

The following is the List of Counties constituting the Show Districts:—

PAGE

1. **Glasgow,** for the Counties of Argyll, Ayr, Bute, Lanark, and Renfrew,—
    - Argyll 5
    - Ayr 7
    - Bute 8
    - Lanark 9
    - Renfrew 12

2. **Perth,** for the Counties of Fife, Forfar (Western Division), Kinross, and Perth (Eastern Division),—
    - Fife 14
    - Forfar (Western Division) 17
    - Kinross 18
    - Perth (Eastern Division) 18

3. **Stirling,** for the Counties of Clackmannan, Dumbarton, Perth (Western Division), and Stirling,—
    - Clackmannan 22
    - Dumbarton 22
    - Perth (Western Division) 23
    - Stirling 24

4. **Edinburgh,** for the Counties of Edinburgh, Haddington, and Linlithgow,—
    - Edinburgh 26
    - Haddington 30
    - Linlithgow 32

5. **Aberdeen,** for the Counties of Aberdeen, Banff, Forfar (Eastern Division), and Kincardine,—
    - Aberdeen 33
    - Banff 37
    - Forfar (Eastern Division) 37
    - Kincardine 38

6. **Dumfries,** for the Counties of Dumfries, Kirkcudbright, and Wigtown,—

Dumfries 40
Kirkcudbright 43
Wigtown 45

7. **Inverness,** for the Counties of Caithness, Elgin, Inverness, Nairn, Orkney and Shetland, Ross and Cromarty, and Sutherland,—

Caithness 47
Elgin 47
Inverness 48
Nairn 50

Orkney and Shetland—

Orkney . . . 50
Shetland . . . 50
Ross and Cromarty 50
Sutherland 51

8. **Border District,** for the Counties of Berwick, Peebles, Roxburgh, and Selkirk,—

Berwick 53
Peebles 54
Roxburgh 55
Selkirk 56

England 58
Ireland 63
The Colonies 63
Foreign Countries 64
Members whose Residences are unknown 65
Diploma Holders, Free Life Members 68
Holders of First-Class Certificate in Forestry, Free Life Members 70

LIST OF MEMBERS

ARRANGED ACCORDING TO COUNTIES AND SHOW DISTRICTS.

*The Members marked * have been Presidents, and † Vice Presidents*

	Admitted
Her Most Gracious Majesty THE QUEEN.	1872
* His Royal Highness The PRINCE OF WALES.	1873
' His Royal Highness The DUKE OF YORK (Honorary Member)	1898

1.—GLASGOW DISTRICT.

EMBRACING THE

COUNTIES OF ARGYLL, AYR, BUTE, LANARK, AND RENFREW.

ARGYLL.

Admitted

1898 Ainsworth, John Stirling, of Ardnaiseig, Kilchrenan

1897 Aird, Robert, M A., F G S, Victoria Bank, Tarbert, Lochfyne

1881 Allan, Alex, of Aros Tobermory

1852 Allan, T W M, of Glenfeochan, Oban

1869 Anderson, Wm D, Ardsheal, Ballachulish

1889 Andrew, David, Knockstaple, Campbeltown

1844*†ARGYLL, The Duke of, K G, Inveraray Castle, Inveraray

1863 Berry, Walter, Glenstriven, Toward

1882 Black, Donald, Clachan, Lochfynehead, Inveraray

1891 Blair, John Simpson, Melfort, Kilmelfort

1884 Boyd, Wm, Killundine, Oban

1899 Brown, Donald, Dunbeg, Connel Ferry

1897 Brown, John C, Island of Rum, Oban

1881 Buchanan, Dr Alexander, Tiree, Tobermory

1881 Buchanan, Angus, Kilvarie, Connel

1853 Buchanan, Dun, Auchinbreck, Colintrave

1890 Buchanan, John, Glenlean, Sandbank

1893 Burk, Herbert, Keil House, Ballachulish

1897 Bullough, George, of Rum, Oban

1889 Cameron, Allan Gordon, of Barcaldine Castle, Letterwalton, Ledaig

1898 Cameron, Duncan, Sheepknowe, Bunessan

1837 Campbell, Alex, of Achendarroch, Lochgilphead

1891 Campbell, Alexander E, Dulletter, Dalmally

1865 Campbell, Lt Col, of South Hall, Colintrave

Admitted

1889 Campbell, Alex James Henry, of Dunstaffnage, Oban

1894 Campbell, Colin George Pelham, Stonefield, Tarbert

1875 Campbell, Capt D, of Inverneil and Ross, Ardrishaig

1882 Campbell, Edward P, Captain, 42nd Highlanders, South Hall Colintrave

1885 Campbell Lt Col H Burnley, of Ballimore, Tigh na bruaich

1883 Campbell, James, of Jura, Greenock

1885 Campbell, James, Shanvallie, Ledaig

1877 Campbell, James, Succoth Villa, Lochgilphead

1874 Campbell, John, of Kilberry, Tarbert

1877 Campbell, John, Glenforsa, Aros, Mull

1894 Campbell, John, Ardifuir, Kilmartin, Lochgilphead

1890 Campbell, Robt. C Graham, of Shirvan, Lochead Lodge, Ardrishaig

1877 Clark, Andrew, Islay

1869 Clark, Archd, Bencorrum, Dunoon

1853 Clark, Archibald, Inverchapple, Kilmun

1893 Clark, Francis William, of Ulva, Aros, N B

1897 Clark, John, Garrachra, Kilmun

1867 Clark, Lachlan, Tangy, Campbeltown

1889 Clark, Robert, Skeroblin, Campbeltown

1898 Coles, Douglas, Drumnatorran, Strontian

1896 Colthart, Robert D, Achateny, Ardnamurchan, Oban

1894 Colvill, Robert, Glensaddell, Campbeltown

1899 Corson, Robt H, Crigan, Appin, Argyllshire

1885 Corson, Thomas, Auction Mart, Oban

1882 Craig, Hugh, Ardoran, Oban

1884 Crerar, Peter C, Brackley, Dalmally

Admitted
1889 **Cunningham, Robert, Kilkivan, Campbeltown**
1867 **Dickie, Robt., Killeonan, Campbeltown**
1897 **Douglas, A. Hugh, Factor, Gigha**
1878 **Duncan, Alex., Duart, Auchnacraig, Mull**
1881 **Duncan, R., Royal Hotel, Tigh-na-bruaich**
1884 **Elliot, Walter, Ardtornish, Oban**
1893 **Ferguson, Archd., Lochaline, Morven**
1897 **Ferguson, James, Ballochyle, Sandbank**
1885 **Finlay, C. Campbell, of Castle Toward, Greenock**
1870 **Fletcher, B. J. C., Dunans, Colintraive**
1897 **Fletcher, John A., Laudale, Ardgour**
1874 **Forsyth, James N. M., of Quinish, Tobermory**
1898 **Fraser, Chas. Jas. Roy, of Kilmun, Kilchrenan**
1884 **Fraser, Duncan, Hotel, Dalmally**
1895 **Fraser, Hugh, Factor, Largie Estate Office, Tayinloan, Argyllshire**
1897 **Galbraith, Don., Craig, Tarbert, Lochfyne**
1897 **Galbraith, Jn., Craig, Tarbert, Lochfyne**
1889 **Gemmell, John, Dalrioch, Campbeltown**
1875 **Gillespie, John, Temperance Hotel, Oban**
1891 **Gillies, John, Barnacarry, Kilninver, Oban**
1897 **Gillies, Neill, Auchnashellach, Lochgilphead**
1889 **Graham, Robt. C., of Skipness, Whitehouse**
1888 **Graham, William, of North Erines, Tarbert (6 Royal Crescent, Glasgow)**
1872 **Grant, A., Cuil House, Inveraray**
1894 **Greig, James, Chiskan, Campbeltown**
1897 **Grieve, R. W., Succoth, Dalmally**
1897 **Guthrie, D. W., Bernice, Kilmun**
1873 **Hall, Allan, Degnish, Ardmaddy, Easdale, Oban**
1875 **Hall, Jas. M., Killean House, Tayinloan**
1888 **Hamilton, George, Crear, Tarbert, Lochfyne**
1899 **Hartley, G. Wm., Hayfield, Kilchrenan**
1865 **Hay, C., Ardbeg, Islay**
1896 **Hay, Colin E., Ardbeg, Islay**
1858 **Hosack, William, Oban**
1889 **Hunter, Jas., Machribeg, Campbeltown**
1857 **Hunter, Wm., Lilybank, Campbeltown**
1894 **Inglis, George Erskine, Machrahanish Estate Office, Campbeltown**
1850 **Lamont, James, of Knockdow, Greenock**
1897 **Laughton, John, Eallabus, Bridgend, Islay**
1875 **Lloyd, T., of Minard Castle, Inveraray**
1869†**LORNE, The Marquis of, K.T.**
1888 **Lothian, James, Rockwood, Campbeltown**
1896 **MacArthur, Alex., Banker, Oban**
1862 **Macarthur, John, Banker, Inveraray**
1861 **M'Callum, John, Fairfield, Kirn**
1879 **M'Coll, Duncan, Clachan House, Lismore, Oban**
1898 **M'Coll, Duncan, Glengorm, Tobermory**
1881 **Macdiarmid, H., Island House, Tiree, Oban**
1899 **Macdiarmid, John A., Arichamish, Ford, Lochgilphead**
1882 **Macdiarmid, Robert, Castles, Lochawe**
1874 **Macdonald, Alex., Gurtnamore Villa, St Andrew Street, Dunoon**
1893 **Macdonald, J. Ronald M., Largie Castle, Tayinloan**
1892 **M'Dougall, Major S., of Lunga, Daill House, Lochgilphead**
1898 **Macfarlane, John, Tervine, Kilchrenan**
1873 **Macfarlane, Lewis, Invermay, Lochgoilhead**
1863 **M'Gibbon, David, Ardnacraig, Campbeltown**

Admitted
1870 **MacGregor, Donald, of Ardgartan, Glencroe (Craigroyston, Merchiston, Edinburgh)**
1883 **MacGregor, Donald, Solicitor, Oban**
1893 **M'Intyre, John Alexander, Frackersaig, Lismore, Oban**
1877 **Mackay, A. F., of Carskey (26 George Square, Edinburgh)**
1892 **M'Kechnie, Dugald, of Tenga, Oban (59 Gilmore Place, Edinburgh)**
1869 **MacKechnie, Jas., Blarcreen House, Taynuilt**
1878 **Mackellar, Peter, Crossaig, Tarbert**
1872 **Mackenzie, John, of Knipoch, Oban**
1891 **Mackenzie, J. H. Munro, of Mornish, Tobermory**
1897 **M'Lachlan, Donald, Island of Rum, Oban**
1886 **Maclachlan, Jn., of Maclachlan, Inveraray (12 Abercromby Place, Edinburgh)**
1870 **Maclaine, M. G., of Lochbuie, Oban**
1888 **M'Laren, Dun., Banker, Tarbert, Lochfyne**
1875 **M'Latchie, W., Ballygreggan, Campbeltown**
1875 **M'Lean, A. J., of Pennycross, Oban**
1897 **Maclean, Roderick, Gometra, Aros, Isle of Mull**
1849 **Macleod, John N., of Kintarbert, Glensaddell, Campbeltown**
1896 **M'Millan, Dr D., Tarbert, Argyllshire**
1894 **M'Nair, Archibald, Moy, Campbeltown**
1897 **M'Naughton, Duncan, Barguillean, Taynuilt**
1898 **Macneal, Capt. Hector, yr. of Ugadale (Woolmanhill Drill Hall, Aberdeen)**
1848 **Macneal, H., of Ugadale, Campbeltown**
1860 **M'NEILL, Maj.-Gen. Sir J. C., of Colonsay, V.C., K.C.M.G., K.C.B.**
1876 **M'Nicol, John, Achandarroch, Ballachulish**
1882 **M'Phail, John, Auchnacraig Farm, Mull**
1891 **Macpherson, Colin D., Corpach, Fort William**
1891 **M'Vean, Colin A., Kilfinichen, Pennyghael. Mull**
1896 **MALCOLM, Lord, of Poltalloch, Lochgilphead**
1875 **Martin, Donald P., of Dunlossit, Port Askaig, Islay**
1874 **Masson, John, Tobermory**
1881 **Maxwell, Wm., Baraskomel, Campbeltown**
1891 **Meikle, R. A., Ri-Cruin, Lochgilphead**
1894 **Melles, Joseph, Gruline Aros, Isle of Mull**
1861 **Mercer, John, Ardnadam, Sandbank**
1893 **Miller, John M., Balliemenach, Portsonachan**
1889 **Mitchell, Archibald, Clockiel, Campbeltown**
1889 **Mitchell, James B., Aros, Campbeltown**
1897 **Morgan, Fred., of Glengorm, Tobermory (Remenham House, Avenue Road, Regent's Park, London)**
1895 **Morris, Major C. H., Killundine, Drimnin, Argyllshire**
1855 **Morrison, Charles, of Islay, Bridgend**
1897 **Mundell, David, Arrivore, Whitehouse, Kintyre**
1897 **Mundell, Hugh, Tarbert, Lochfyne**
1877 **Munro, D. H. C., of Keulochlaich, Appin**
1888 **Munro, John, Ironmonger, Oban**
1888 **Nicolson, Neil, Auchgoyle, Tigh-na-bruaich**
1887 **ORDE, Sir A. J. Campbell, of Kilmory, Bart., Lochgilphead**
1887 **Orde, Colin Campbell, Kilmory, Lochgilphead**
1889 **Ralston, Gav., Kilmichael, Campbeltown**
1896 **Ramsay, Iain, of Kildalton, Port Ellen, Islay**

Admitted
1882 Reid, Peter, Port Ellen, Islay—*Free Life Member*
1897 Revie, John, Banfad, Tarbert, Kintyre
1892 Robertson, Alexander, Chemist, Oban
1891 Routledge, Joseph, Annat, Banavie, Fort William
1893 Scarlett, W. J. Yorke, Gigha
1891 Shairp, Alex., Land Agent and Architect, Oban
1884 Shankland, Wm., Killicheran, Lismore
1884 Smith, T. V., of Ardtornish, Oban
1881 Smith, W. Anderson, Ledaig
1894 Stewart, Archibald, Darlochan, Campbeltown
1863 Stewart, Com. D., R.N., Knockrioch, Campbeltown
1881 Stewart, John Lorne, of Coll, Oban
1871 Stewart, Capt. J. C., of Fasnacloich, Craig Villa, Oban
1858 Stewart, Robt., of Kinlochmoidart, Salen (4 Moray Place, Edinburgh)
1892 Stuart, Mrs E., Dalness, Glenetive, Taynuilt
1889 Sutherland, John D., Oban
1893 Thom, Allan Gilmour, Canna
1891 Thomson, Duncan, Inveryne, Tigh-na-bruaich
1859 Thorburn, David, St Mary's, Tobermory
1870 Tod, James, Rashfield, Kilmun
1897 Tod, James Allan, Inverinan, Kilchrenan
1875 Turner, A., Kilchamaig, Whitehouse, Kintyre
1893 Veitch, John, Tiroran, Pennyghael, Isle of Mull
1876 Whyte, D. C., Crossaig, Kintyre
1863 Wyllie, James, Factor, Inveraray
1887 Young, William, Drum, Campbeltown

AYR.

1882†Ailsa, The Marquis of, Culzean Castle, Maybole
1897 Aird, David, The George Hotel, Kilmarnock
1895 Allan, James, Blackstone, Dalry, Ayr
1897 Allan, John, West Bankside, Kilbirnie
1882 Alston, George, Loudoun Hill, Darvel
1897 Angus, Robt., Lugar, Ayrshire
1897 Baird, J. G. A., M P., Adamton, Monkton
1870 Baird, John, Burnfoot Cottage, Falkland, Newton-on-Ayr
1897 Blair, Colonel Fred. G , of Blair, Dalry
1897 Blair, Robert, British Linen Co. Bank, Galston
1893 Bone, David, Auchencloigh, Galston
1882 Bone, William, Shalloch Park, Girvan
1893 Borland, John Kennedy, North Balloch, Girvan—*Free Life Member*
1865 Boyd, Col. J. Hay, of Townend, Symington, Kilmarnock
1890 Brisbane, C. T., of Brisbane, Largs
1866 Brown, David, Banker, Maybole
1870 Bruges, Edward C., Dalgig, New Cumnock
1889 Caldwell, John, Kilnford, Dundonald
1897 Cameron, Andrew, Clydesdale Bank, Newmilns
1894 Campbell, James Archibald, of Craigie, Ayr
1887 Campbell, W. K. H., of Nether Place, Mauchline
1870 Christie, James M , Lauristina, South Beach Road, Ardrossan
1895 Clark, James, of Nunland Common, Auchinleck
1857 Clark, William, Shawhill, Monkton
1891 Clark, W. K., Currah Farm, Girvan
1877 Cochrane, James, Cattle Market Hotel

Admitted
1882 Cochrane, Hon. Thomas, M.P., Largs
1897 Craig, James, Cunning Park, Ayr
1865 Crawford, J., Milnstonford, W. Kilbride
1896 Crawford, Jn., jun., Manraehead, Beith
1897 Crawford, Thomas, Dowhill, Girvan
1859 Cunningham, W. C. S., of Caprington, Kilmarnock
1857 Deans, J. Y., of Kirkstyle, Kilmarnock
1889 Dempster, Jas. R., yr. of Ladyton, Galston
1898 Donald, Thomas, Annandale, Kilmarnock
1890 Drummond, Hugh, Craighead, Mauchline
1893 Duke, Guy, Braehead Office, Kilmarnock
1887 Dunlop, And. T. L., Lyonston, Maybole—*Free Life Member*
1869 Dunlop, Gabriel, Castle Farm, Stewarton
1896 Dunlop, James, Midland, Fenwick
1875 Dunlop, Quintin, Morriston, Maybole
1897 Dunlop, William, Dunure Mains, Ayr
1889 Dunlop, Wm. Hamilton, of Doonside, Ayr
1897 Eglinton and Winton, Earl of, Eglinton Castle, Irvine
1880 Fergusson, John B., County Club, Ayr
1854 Fergusson, Right Hon. Sir James, of Kilkerran, Bart., M.P., Maybole
1897 Forrest, Robert, Knockinlaw, Kilmarnock
1875 Foulds, A. R., of Clerkland, Stewarton
1891 Fraser, M. P., Rankingston, Patna
1892 Fraser, William L., Kirkmichael House, Maybole
1897 Gairdner, D. C., Union Bank, Kilmarnock
1882 Garvie, R. G., Drumellan House, Maybole
1898 Gemmell, Alexander, Solicitor, Ayr
1885 Gemmell, Andrew, Lugton Ridge, Beith
1875 Gemmel, G. C., Upper Whitehaugh, Muirkirk
1875 Gilmour, Alex., Annfield House, Irvine
1875 Gilmour, James, Orcharton, Cumnock
1881 Glasgow, The Earl of, Kelburn, Fairlie
1894 Gray, William, Grougar Bank, Galston
1884 Guthrie, Wm., Ryefield, Dalry, Ayr
1890 Hamilton, Claude, Carbieston, Ayr
1853 Hamilton, Hugh, of Pinmore, Daljarrock, Ayrshire
1897 Hamilton, James, Drumburle, Dailly
1865 Hamilton, J., Wallace Bank, Kilmarnock
1887 Hamilton, John W., of Cairnhill, Kilmarnock
1889 Hannah, John M , Girvan Mains, Girvan
1897 Hart, P. Campbell, C.E., Kilmarnock
1878 Hay, J. F. Dalrymple, Dunlop House, Dunlop
1872 Hazle, Alex., Regent Terrace, Prestwick, Ayr
1874 Henderson, Richard, Portland Estates Office, Kilmarnock—*Free Life Member*
1897 Hendrie, John, Union Bank, Galston
1897 Hendrie, Robt., Howletburn, Galston
1895 Hood, James, Dornniston, Coylton
1865 Houldsworth, Henry, Carrick House, Ayr
1857 Houldsworth, J. H., Rozelle, Ayr
1865 Houldsworth, J. M., Ayr
1857 Houldsworth, Wm., Rozelle, Ayr
1876 Howatson, W. M. S., Carskeoch, Patna
1865†Howatson, Chas., of Glenbuck, Glenbuck
1896 Howatson, Chas. Nile, yr. of Glenbuck, Glenbuck, N.B.
1897 Howie, James, Hillhouse, Kilmarnock
1897 Howie, John, Wellington Chambers, Ayr
1857 Howie, John, Hurlford, Kilmarnock
1894 Howie, M. G., Law Farm, Dreghorn
1889 Howie, Thomas, Fairfield Mains, Monkton, Ayr

Admitted
1899 Howie, Thos., jun., Mosswood, Galston
1897 Howie, William, Burnhouses, Galston
1867 Hunter, David, 3 Barns Terrace, Ayr
1894 Hunter, Hugh, Mossbog, Tarbolton
1895 Hunter, Matthew, Adamhill, Craigie, Kilmarnock
1878 Hunter, Thomas, Implt. Maker, Maybole
1897 Hunter, William, Foulton, Monkton
1897 Hyslop, William, Knockvloid, Barrhill
1895 Inglis, Chas. D., Stair House, Tarbolton
1877 Inglis, Robert, Loveston House, Girvan
1885 Johnstone, James, Alloway Cottage, Ayr
1888 Kennedy, James, of Doonholm, Ayr
1895 Kennedy, Roland F., of Finnarts, Glenapp, Ballantrae
1870 Kennedy, William, Claremont, Ayr
1874 Kennedy, Wm., 2 Queen's Terrace, Ayr
1897 Kerr, John, Collenan, Troon
1897 Kerr, William, Houdstone, Girvan
1896 Kilpatrick, James, Craigie Mains, Kilmarnock
1889 King, Robert A., Ayr
1897 Knox, James, Place, Kilbirnie
1878 Latta, William, Darmalloch, Cumnock
1895 Lees, Robert, Lagg, Ayr
1865 Lindsay, John, Semple House, Stewarton
1895 Lindsay, Thomas C., Aitkenbrae, Monkton, Ayrshire
1889 Littlejohn, James, Genoch, Ayr
1897 M'Candie, Donald, Ayr Road, Cumnock
1874 M'Connell, Wm., of Knockdolian, Girvan
1894 Macfarlane, Donald J., Cronberry, Old Cumnock
1879 M'Farlane, Richard, County Club, Ayr
1887 M'Jannet, Archibald C., Irvine
1886 M'Min, Thomas M'C., Craigievar, West Kilbride
1877 Marshall, John, Implt Maker, Maybole
1897 Marshall, Peter P. (Jack & Sons), Maybole
1875 Martin, Donald T., of Girgenti, Irvine
1890 Martin, J. C., 10 Cassillis Street, Ayr
1896 Meikle, John, Auchincruive Estate Office, Mounthamilton, Ayr
1886 Middlemas, Wm., Solicitor, Kilmarnock
1897 Millar, William, Nile Court, Ayr
1893 Mitchell, James, Middlefield, Muirkirk
1882 Montgomerie, Rob., Lessnessock, Ochiltree
1889 Montgomery, John, Meadowhead, West Kilbride
1893 Morton, Alexander, Gowanbank, Darvel
1892 Morton, William, Highbowhill, Newmilns
1897 Muir, Gilbert, Knockdon, Maybole
1897 Murchland, William, Bank Street, Kilmarnock
1867 Murray, G., Girvan
1897 Murray, John, jun., Carston, Ochiltree
1897 Neilson, Walter, Ewenfield, Ayr
1884 Niven, Richard, Airlie, Ayr
1870 Oswald, Rich. A., of Auchincruive, Ayr
1897 Page, Andrew D., Culzean Home F[illegible] Maybole
1897 Paterson, Wm. A Orr, of Gadgirth, 21 Wellington Square, Ayr
1897 Paton, A. B., Hareshawmuir, Kilmarnock
1888 Paton, Hugh (W. Samson & Co.), Kilmarnock
1897 Pearson, J. M., C.E., 5 John Dickie Street, Kilmarnock
1881 Pollock, A., Mauchline
1889 Pollock, R. M., Middleton, Ayr
1895 Reid, David H., 72 Green Street Lane, Ayr
1897 Reid, Robt. M., Bonshaw, Stewarton
1898 Richmond, Robert, Drumshaug, Ayr

Admitted
1898 Robb, Daniel, South Palmerston Farm, Ochiltree—*Free Life Member*
1894 Robertson, Andrew, Holmes Farm, Kilmarnock
1857 Roger, Hugh, Hillhead, Kilmarnock
1899 Salomons, Jos. L., Bowes, Old Cumnock
1897 Salterthwaite, Benj. H., Portland Estates Office, Kilmarnock
1882 Scott, C. W., Everlie, Skelmorlie
1890 Scott, John, C B., of Hawkhill, Largs
1875 Scott, Robert Sinclair, Burnside, Largs
1872 Shaw, Chas. G , Ayr
1893 Shaw, D. W., 17 Wellington Square, Ayr
1893 Shaw, Philip A., Blair, Maybole
1898 Shields, Major J., Glenrosa, Newmilns
1888 Skeoch, P. M'Kinnon, Boydstone, Beith
1870 Sloan, John, Alton Albany, Barr, Girvan
1889 Smith, Robert, Sheilds, St Quivox, Ayr
1897 Smith, Robert, The Grange, Kilmarnock
1880 Smith, Thomas, The Castle, Maybole
1882 Somervell, James, of Sorn, Mauchline
1879 Speir, Robert, Rosebank, Largs
1898 Steel, Captain John, Burnhead, Darvel
1895 Steven, John, Purroch, Hurlford, Kilmarnock
1885 Stevenson, Allan, Architect, Ayr
1888 Stevenson, David, Silverwood, Kilmarnock
1885 Stevenson, David, Crossburn, Troon
1888 Stevenson, John, Woodland, Girvan
1858 Stewart, James, Heathfield, Irvine
1882 Stuart, A., Muirhouse, Symington, Kilmarnock
1894 Tannahill, Robert D., National Bank Buildings, Kilmarnock
1876 Taylor, H., Kamishill, Hurlford, Kilmarnock
1898 Thorburn, Thomas, The Limes, Beith
1882 Thornycroft, J. B., Netherplace, Mauchline
1886 Tivendale, William, Burn House, Galston
1891 Todd, Hugh, Harperland, Dundonald
1884 Turner, J. H , Portland Estates Office, Kilmarnock
1867 Vernon, Hon. G. R., Auchans House, Kilmarnock
1873†Villiers, F. E., Ayr
1887 Wallace, H. R., Cloncaird Castle, Maybole
1875 Wallace, Robert, Auchenbrain, Mauchline
1895 Wallace, Wm., Cattle Dealer, Mauchline
1874 Wardrop, Robert, Garlaff, Cumnock
1897 Watson, Alex , Barbeigh, Sorn, Galston
1868 Weir, W , of Kildonan, Shewalton, Dreghorn
1889 Whyte, Robert, East Raws, Kilmarnock
1882 Willison, Alex., Easterhill, Dalry
1873 Willison, George, Braeside, Dalry
1897 Wilson, Robert, jun., Northfield, Dunlop
1893 Wilson, Robert, Auchincloigh, Ochiltree
1882 Wright, R. P., Downan, Ballantrae—*Free Life Member*
1884 Wyllie, Alex., Holmbyre, Dalry
1898 Young, David, Nether Whitburn, Largs
1868 Young, John, jun., Ayr

BUTE.

1870 Allan, James, Balnacoole, Shiskine Arran
1889 Anderson, Francis, Bute Estate Office, Rothesay
1897 Bannatyne, John, The Hotel, Lamlash
1869†Bute, The Marquis of, K.T., Mount Stuart, Rothesay
1897 Crawford, Robert, Glenscorrodale, Lamlash

Admitted
1889 Dickie, Wm. P., Cranslagvourty, Rothesay
1889 Duncan, Chas., Little Kilmory, Rothesay
1875 Duncan, Jas., Bannatyne Mains, Rothesay
1892 Duncan, James L., Birgedale, Knock, Rothesay—*Free Life Member*
1897 Fisher, Jas., Grain Merchant, Rothesay
1889 Gilmour, Thomas, Kilchattan Tile Works, Rothesay
1889 M'Alister, Robert, Mid Ascog, Rothesay
1889 MacAlister, James, Meikle Kilmory, Rothesay
1861 Macdonald, P., The Douglas Hotel, Brodick
1889 Macfie, Hugh, Ballycaul, Rothesay
1889 Macfie, John, Lubas, Rothesay
1881 M'Intyre, Wm., Mount Stuart, Rothesay
1878 Mackay, Archibald M., Bruchag, Rothesay
1876 M'Pherson, Don., Queen's Hotel, Rothesay
1897 Morton, John, Machrie, Shiskine
1878 Murray, Patrick, Strabane, Brodick
1897 Robertson-Fullarton, A. L. T., Kilmichael, Brodick (201 Bath Street, Glasgow)
1881 Stuart, J. Windsor, Rothesay
1864 Tod, William, Glenree, Lamlash
1897 Tod, William, jun., Glenree, Lamlash
1892 Walker, James L., Bank of Scotland, Lamlash
1887 Wallace, John, Glenkill, Lamlash

LANARK.

1897 Agnew, John, Viewfield, Carluke
1893 Aikman, C. M., M.A., D Sc., 128 Wellington Street, Glasgow
1882 Aikman, Thomson, 5 Princes Square, Glasgow
1897 Aikman, Major Thos. R., The Ross, Hamilton
1875 Alexander, Jas., 145 North Street, Glasgow
1864 Allan, Alex , Waddiefield, Hamilton
1892 Allan, Henry, Carstairs House, Carstairs
1877 Allan, James, Kirklands, Dolphinton
1870 Andrew, W. J., Banker, Coatbridge
1864 Bain, James, Bank of Scotland, Glasgow
1887 Bain, W. P. C., Lochrin Iron Works, Coatbridge
1878 Baird, Archibald, Hopetoun Park Road, Hamilton
1880 Baird, John, c/o W. Taylor, 168 West George Street, Glasgow
1886 Barr, Duncan C., Factor, Hamilton
1802 Barr, James, Whiteshaw, Carluke
1882 Beckitt, C. R., Rockvilla Oil Mills, Port Dundas
1877 Beith, Gilbert, 7 Royal Bank Place, Glasgow
1852 Bertram, Wm., of Kersewell, Carnwath
1896 Black, William, of Stanrigg, Airdrie
1893 Boyle, Adam H., Ruchhill House, Maryhill
1881 Brock, H., V.S., 118 North Street, Glasgow
1878 Brown, James, of Orchard, Carluke
1898 Brown, James, Merryton, Hamilton
1891 Brown, John Hillhead, Airdrie—*Free Life Member*
1882 Brown, John, Shields, East Kilbride
1897 Brown, Peter S., Bothwell Park, Bothwell
1896 Brown, Robert, Craighead, Bothwell
1898 Brown, William D., Photographer, Lanark
1877 Brownlie, R., Bogside, Newmains, Carluke

Admitted
1875 Brownlie, T., 1 Carlton Terrace, Kelvinside, Glasgow
1849 BUCHANAN, Colonel Sir David Carrick, K.C.B., of Drumpellier, Coatbridge
1876 Buchanan, Capt. J. R. G., of Scotstone, Eastfield House, Cambuslang
1865 Burns, James C., Glenlee, Hamilton
1884 Cadzow, Robt., Borland, Walston, Biggar
1897 Cameron, John J. (A. & J. Main & Co.), Clydesdale Ironworks, Possilpark, Glasgow
1858 Campbell, William, Solicitor, Hamilton
1877 Cathcart, J. P., 135 Buchanan Street, Glasgow
1882 Chapman, Wm., Meadowhead, Airdrie
1898 Chislett, Charles, Chemist, Lanark
1857 Christie, T. C., of Bedley, Chryston
1889 Clark, Alexander, Todlaw, Lesmahagow
1881 Clark, W. A., Crutherland, East Kilbride
1869 Clarke, John, Hamilton
1898 Clarkson, James, Prett's Mill, Lanark
1888 Clement, And., Cheese Merchant, Glasgow
1875 Clerkson, Alexander, Cleghorn, Lanark
1890 COLEBROOKE, Sir Edward, of Crawford, Bart., Abington
1871 Comrie, Alex., 12 Colebrooke Street, Hillhead, Glasgow
1876 Coubrough, Wm., Sornfallow, Wiston, Biggar
1864 Cousland, Jas , 7 Rupert Street, Glasgow
1873 Cowan, James, 23 St Vincent Place, Glasgow
1888 Craig, John, High Ploughland, Strathaven
1882 Craig, John, of Bellsfield, Blantyre
1885 Craig, John, South Halls, Strathaven
1884 Cranston, Stuart, 28 Buchanan Street, Glasgow
1882 Crawford, Alexander, Netherton, Carmunnock
1897 Crichton, David, Estate Office, Drumpellier, Coatbridge
1897 Crighton, William, Charleston, Lanark
1898 Crum, William Graham, Thornliebank, Glasgow
1860 Dalziel, George, Goldielea, Uddingston
1870 Davidson, Hugh, of Braedale, Lanark
1894 Davidson, Wm., Gateside, Douglas
1881 Dawson, John M., 56 George Square, Glasgow
1899 Dawson, Wm. (Anderston Brewery), 79 Hill Street, Glasgow
1895 Dennistoun, A. H. O., of Golfhill, Glasgow
1881 Duke, William, 1 Princes Street, Pollokshields, Glasgow
1891 Dunlop, Colin, jun., Hutton Bank, Hamilton
1889 Dunn, Richard, Udston, Hamilton
1869 Dykes, J., jun., 92 St Vincent Street, Glasgow
1887 Elliot, William, Auction Mart, Lanark
1884 Findlay, John, Springhill, Baillieston
1888 Findlay, John, Warrenhill, Thankerton
1897 Findlay, John W., Estates Office, Bank Street, Airdrie
1898 Findlay, M. F., 41 Ann Street, Glasgow
1855 Findlay, Rob., of Springcroft, Baillieston
1861 Fleming, Alex., Raith, Bothwell
1899 Fleming, And., West Mains, Newbigging, Carnwath
1867 Fleming, David, Avonmill, Hamilton
1888 Fleming, David, Castleton, Rutherglen
1882 Fleming, James, Muirside, Carmunnock
1877 Fleming, John, Strathaven
1870 Fleming, J., Meadowbank Cot., Strathaven
1876 Fleming, J. B., of Beaconsfield, Glasgow
1882 Fleming, Wm., Windlaw, Carmunnock

Admitted
1895 Fleming, William, Calla, Carnwath
1888 Fowler, John, 4 Kelvinbank Ter., Sandyford, Glasgow
1899 Fraser, D. Speirs, East Shield, Carnwath
1899 Fraser, Geo. J. J. H. G., Factor, Dalzell Farm, Motherwell
1877 French, James, Netherton, Abington
1867 Frew, Thos., 6 Windsor Terrace, Glasgow
1897 Fulton, James, 1 Regent Park Square, Strathbungo, Glasgow
1872 Galbraith, W. W., Croftfoot, Gartcosh
1888 Garroway, William, 694 Duke Street, Glasgow
1878 Gibb, John, Midtown, Carluke
1897 Gibson, Richard, Kirkton St., Carluke
1891 Gilchrist, John, Orbiston Mains, Bellshill, Glasgow
1877 Gillies, Wm., Shawlands House, Shawlands, Glasgow
1882 Gilmour, Arthur, Crosshill, East Kilbride
1894 Glen, William, 32 Berkeley Terrace, Glasgow
1877 Goff, Dr Bruce, The Lindens, Bothwell
1887 Goodwin, John, Clydeview, Motherwell
1893 Gordon, Henry Erskine, of Aikenhead, Cathcart
1883 Gow, Andrew, factor, Wishaw
1873 Grahame, Jas., Western Club, Glasgow
1887 Grant, Henry O. Ogilvie, of Grant, 53 Miller Street, Glasgow
1876 Gray, John, 181 Renfrew Street, Glasgow
1867 Greenshields, J., West Town, Lesmahagow
1897 Grierson, Adam, New Cross, Strathaven
1884 Haddow, Robt., Cold Chapel, Abington
1895 Hamilton, C. G. Henderson, of Dalserf, Netherburn
1897 Hamilton, D., M.R.C.V.S., Bourtreehill, Hamilton
1875 Hamilton, Gavin, of Auldtown, Lesmahagow
1889 Hamilton, Gavin, jun., B. L. Co Bank, Lesmahagow
1896 Hamilton, George L., 25 Robertson St., Glasgow
1897 Hamilton, James, Aldersyde, Uddingston
1869 Hamilton, Jas., Woolfords, Cobbinshaw
1881 Hamilton, James A., 7 Shaftesbury Terrace, W. Regent Street, Glasgow
1897 Hamilton, J. B., M.R.C.V.S., Corporation Tramways, Glasgow
1870 Hamilton, John Nisbet, Coulter, Biggar
1857 HAMILTON of Dalzell, Lord, Dalzell, Motherwell
1893 Hamilton, Robert, High Motherwell, Motherwell
1877 Hamilton, Thomas, Poniel, Douglas
1897 Hamilton, T. B., M.R.C.V.S., Coplawhill, Glasgow
1897 Hastie, David, Stonefield Farm, Blantyre
1897 Hill, Thomas, 66 Robertson St., Glasgow
1872 Houldsworth, W. J., Coltness House, Wishaw
1898 Howatson, R. B., 4 West Regent Street, Glasgow
1897 Howie, Robert (P. & R. Fleming & Co.), St Germains, Bearsden, Glasgow
1897 HOZIER, The Hon. James C., M.P., Mauldslie Castle, Carluke (22 Berkeley Square, London, W.)
1862 HOZIER, Lord, of Newlands, Mauldslie Castle, Carluke
1869 Hunter, William, Craighead, Abington
1896 Imrie, Peter, Blackhill, Maryhill, Glasgow
1878 Inch, John, Howburn, Walston, Biggar
1876 Inch, Thomas, Gilkerscleuch, Abington
1855 Jack, Robt., Banker, Motherwell
1897 Jackson, George, Woodhead, Chryston, Glasgow

Admitted
1857 Jeffray, John, Cardowan House, Millerston
1893 Johnston, George, Mossfield, Springburn, Glasgow
1876 Johnston, James, Pather Farm, Wishaw
1878 Johnston, Jas., Lochburnie, Maryhill
1893 Kennedy, M. H., Contractor, Partick, Glasgow
1888 Kerr, James, Bloomgate, Lanark
1857 Kerr, Robert, 307 St Vincent Street, Glasgow
1860 King, Robert, Levernholm, Hurlet
1891 Laidlaw, John, 98 Dundas Street, S.S., Glasgow
1897 Laidlaw, Thomas K., Western Club, Glasgow
1882 Lamberton, Andrew, Sunnyside Works, Coatbridge
1884 LAMINGTON, Lord, Lamington House
1864 Latta, M. R., Carmyle, Tollcross, Glasgow
1895 Lawrie, James, West Newton, Strathaven, Lanarkshire
1896 Lawrie, John M‘Nab, 18 Watson Street, Glasgow
1897 Lawson, John, 175 West George Street, Glasgow
1893 Leiper, Robert, Yardbent, Strathaven
1872 LOCKHART, Sir S. M., of Lee and Carnwath, Bart., Lanark
1884 Lockhart, Major-General Graeme, of Castlehill, C.B., Cambusnethan House, Wishaw
1870 Lockhart, Wm. Eliott of Cleghorn, Lanark
1898 Logan, Robert J., Newmains, Carnwath
1874 Love, Jas., 12 St James Street, Paisley Road, Glasgow
1885 M‘Alpine, A. N., Glasgow and West of Scotland Technical College, 60 John Street, Glasgow—*Botanist to the Society*
1868 M‘Call, Prof. J., Veterinary College, Glasgow
1846 M‘Call, Henry, of Daldowie, Glasgow
1899 M‘Cowan, Robert, Bank of Scotland, Strathaven
1888 Macdonald, Dr, 40 Lilybank Gardens, Hillhead, Glasgow
1884 M‘Farlane, John, 151 North St., Glasgow
1897 MacGregor, James (P. & R. Fleming & Co.), Argyle Street, Glasgow
1872 M‘Ilwraith, James, 92 Regent Street, Glasgow
1864 Mackie, J. L., Ravelston, Great Western Road, Glasgow
1896 Mackie, Peter Jeffrey, Auchlochan, Lesmahagow
1896 M‘Kinlay, Robert, Hillhouse, Sandilands, Lanark
1894 M‘Kirdy, W. A. Scott, of Birkwood, Lesmahagow
1876 Maclae, A. Crum, of Cathkin, 149 St Vincent Street, Glasgow
1883 MacLellan, Robert, Conservative Club, Glasgow
1888 M‘Lennan, Bailie James, 40 St Andrew Street, Glasgow
1882 M‘Neilage, A., 93 Hope Street, Glasgow
1896 M‘Neill, John, 1 Great Western Terrace, Glasgow
1875 M‘Pherson, D., 95 Finlay Drive, Dennistoun, Glasgow
1884 M‘Queen, Hope, Midlock, Abington
1884 M‘William, Andrew, 85 Queen Street, Glasgow
1879 Main, R. R. (A. & J. Main & Co.), Possil Park, Glasgow
1899 Marshall, Arch., Auctioneer, Carluke
1889 Marshall, James, Airbles, Motherwell
1895 Marshall, Robert C., Caldergrove, Newton, Glasgow

Admitted
1858 **Martin, John**, 50 West Scotland Street, Glasgow
1884 **Millar, John**, 16 St Vincent Place, Glasgow
1892 **Millar, John**, Fern Hill, Cathkin, Rutherglen
1868 **Miller, G. J.**, of Frankfield, Shettleston
1885 **Mitchell, James**, Auchengray House, Airdrie
1894 **Mitchell, John**, 18 Shaftesbury Street, Glasgow
1897 **Mitchell, Matthew**, Milton Farm, Glasgow
1888 **Mitchell, Robt.**, M.R.C.V.S., 18 Shaftesbury Street, Glasgow
1894 **Mitchell, Robert**, jun., 18 Shaftesbury Street, Glasgow
1889 **Mitchell, William**, Hazleside, Douglas
1861 **Moffat, George**, 128 Gartland Drive, Dennistoun
1893 **Moore, Wardrop**, yr. of Greenhall, Blantyre
1808 **Morrison, Thomas S.**, 16 Graham Square, Glasgow
1875 **Morton, J.**, Nether Abington, Abington
1859 **Mosman, H.**, of Auchtyfardle, Lesmahagow
1874 **Muirhead, William**, Winton Place, Uddingston
1875 **Murdoch, Alexander**, Gartcraig, Shettleston
1888 **Murdoch, James**, jun., Gartcraig, Shettleston
1874 **Murdoch, J. F.**, East Hallside, Newton
1875 **Murdoch, John**, Carntyne, Shettleston
1857 **Murdoch, Robert**, Hallside, Newton
1893 **Murdoch, William**, 3 Eglinton Lane, Glasgow
1898 **Murray, H. M.**, Canadian Government Agent, 52 St Enoch Square, Glasgow
1894 **Murray, James**, Low Ploughland, Darvel
1862 **Murray, John L.**, of Heavyside, Biggar
1884 **Murray, John**, Parkhall, Douglas
1874 **Murray, Robert G.**, of Spittal, Biggar
1879 **Murray, W. G. G.**, 93 Hope Street, Glasgow
1875 **Napier, John S.**, of Lethame, Strathaven
1893 **Neilson, James**, of Mossend, Carfin Hall, Holytown
1867 **Neilson, William**, Bank of Scotland, Bellshill
1898 **Nelson, T. C.**, Live Stock Agent, Bellgrove Street, Glasgow
1887 **Nimmo, Thomas**, Lawhead, Forth
1877 **Paterson, G. R.**, Drumalbin, Thankerton
1884 **Paterson, James**, jun., Over Abington, Abington
1882 **Paterson, John**, Candy Cottage, Biggar
1862 **Paterson, John**, Nether Howcleugh, Moffat
1887 **Paterson, John**, of Torfoot, Strathaven
1894 **Paterson, John W.**, 60 Duke Street, Glasgow—*Free Life Member*
1848 **Paterson, Robert**, of Birthwood, Biggar
1896 **Paterson, William**, Glentaggart, Douglas
1884 **Paterson, Wm.**, Grange, Thankerton
1885 **Paton, James**, Glencaple, Abington
1890 **Paton, Thomas** (Perth Auction Mart), 4 Whitehill St., Dennistoun, Glasgow
1878 **Payne, James**, 62 Cromwell St., Glasgow
1854 **Pearson, Andrew A.**, of Springfield, Carluke
1889 **Pollock, James**, V.S., Hamilton
1884 **Pollock, W.**, Yoker Mains, Glasgow
1899 **Prentice, Thomas**, Saddler, Carluke
1884 **Pringle, John**, Castle Mains, Douglas
1892 **Ralston, Chas. W.**, Garscube, Maryhill
1890 **Ramsay, Professor G. G.**, University, Glasgow
1898 **Rankin, William B.**, W.S., Cleddans House, Airdrie (23 Castle St., Edin.)

Admitted
1882 **Rattray, Patrick**, C.A., 45 West Nile Street, Glasgow
1893 **Reid, C.**, Photographer, Wishaw
1867 **Reid, F. R.**, of Gallowflat, Rutherglen
1879 **Reid, F. R.**, jun., Gallowflat, Rutherglen
1885 **Reid, William**, 140 St Vincent Street, Glasgow
1882 **Renwick, Robert**, Buchley, Bishopbriggs
1874 **Richardson, George**, Western Club, Glasgow
1867 **Ritchie, John**, Whitecastle, Biggar
1882 **Robb, Geo.**, 11 Germiston Street, Glasgow
1896 **Robertson, And. R.**, 2 Lorne Terrace, Maryhill—*Free Life Member*
1897 **Robertson, Donald**, Torrisdale, Springburn, Glasgow
1856 **Robertson, John**, 20 Wilson Street, Hillhead, Glasgow
1882 **Rodger, Hugh**, Derby House, Uddingston
1884 **Ross, John M.**, 2 Devonshire Gardens, Glasgow
1898 **Russel, William**, Longlees, Biggar
1894 **Russell, Alexander**, 175 West George Street, Glasgow
1867 **Russell, Archibald**, Auchenraith, Bothwell
1877 **Russell, George**, Carnwath
1875 **Russell, James**, National Bank, Airdrie
1882 **Russell, James**, Allanton, Hamilton
1897 **Russell, John**, Cleghorn Mill, Hamilton
1897 **Russell, Patrick B.**, Newfield Hamilton
1871 **Salmond, David S.**, 137 West George Street, Glasgow
1875 **Sanderson, James**, West Yard Houses, Carnwath
1897 **Scott, David**, Unthank Farm, Mossend
1878 **Scott, Jas.**, Distiller, Garrion Tower, Wishaw
1868 **Scott, J.**, Springfield House, Uddingston
1885 **Scott, John**, jun., Auchinloch, Lenzie
1897 **Scott, William**, Gilfoot, Carluke
1875 **Scott, William**, Priestfield, Blantyre
1882 **Shirlaw, James**, Carfin, Motherwell
1896 **Sime, John**, 162 Buchanan St., Glasgow
1897 **Simpson, Alex. M.**, Whitecrop Farm, East Kilbride
1877 **Skead, George**, Royal Bank, Wishaw
1894 **Sleigh, C. W.**, Estate Office, Blackwood, Lesmahagow
1889 **Smellie, James**, Coursington, Motherwell
1856 **Smith, Andrew**, Milnwood, Lanark
1857 **Smith, H.**, 9 Kelvinside Terrace (North), Glasgow
1897 **Somerville, Thos. Purdie**, Muirhouse, Carnwath
1898 **Sommerville, John L.**, 11 Hopetoun Pl., Glasgow
1886 **Speir, John**, Newton Farm, Newton, Glasgow
1888 **Sprot, Major A.**, of Garnkirk, Chryston, Glasgow
1883 **Stalker, Donald**, Mossend Farm, Mossend, Glasgow
1861 **Stark, W.**, Point House, Cattle Wharf, Glasgow
1891 **Steel, Matthew Taylor**, 135 Buchanan Street, Glasgow
1891 **Stein, A. H.**, of Kirkfield, Lanark
1889 **Steven, Hugh**, Milton Iron Works, Glasgow
1869 **Stewart, D. W.**, Cartland, Lanark
1879 **Stewart, John**, Mossvale House, Chryston, Glasgow
1881 **Stewart, R. K.**, of Murdostoun, Newmains
1855 **Stodart, David**, Banker, Lanark
1889 **Stuart, Col. Harington**, of Torrance, East Kilbride

Admitted

1892 Swan, James G., 74 Bath Street, Glasgow

1881 Tennant, James, 7 Hillend Gardens, Hyndland Road, Glasgow

1897 Tervit, John, Wistown, Thankerton

1881 Tervit, John, Roseland, Covington, Thankerton

1879 Thiem, A M, Windsor Hotel, St Vincent Street, Glasgow

1889 Thomson, A J, of Huntfield, Biggar

1869 Thomson, John, 41 Mitchell Street, Glasgow

1882 Thomson, Seton (Rose, Murison, & Thomson), St Vincent Place Glasgow

1884 Thomson, William, Violet Bank, Dumbreck, Ibrox

1875 Thomson, W G, 41 Mitchell Street, Glasgow

1899 Tullis, John, Inchcape, Dennistoun, Glasgow

1896 Turnbull, Wm, Daldowie, Broomhouse, Glasgow

1882 Ure, John, 66 Washington Street, Glasgow

1882 Vere, J C Hope, of Blackwood, Lesmahagow

1882 Walker, William, 653 New City Road Glasgow, W

1897 Walker, William Hamilton, Cardarroch House, Airdrie

1882 Wallace, Hugh, 30 Havelock Street, Glasgow

1893 Wallace, James, Graham Square, Glasgow

1888 Wallace, John, 273 Argyle Street Glasgow

1882 Wallace, John, The Ingle, Rutherglen

1893 Wallace, Robert, Graham Square, Glasgow

1879 Wallace, W (John Wallace & Sons), Graham Square, Glasgow

1897 Wallace, William, 281 Gallowgate, Glasgow

1896 Watkins, G S, 186 West George Street, Glasgow

1882 Watson, Adam, Oggs Castle, Newbigging, Lanark

1888 Watson G M, Bartlaws, Lamington

1883 Watson, John, 205 West George Street, Glasgow

1897 Watson, J, National Bank, Crosshill, Glasgow

1884 Watson, Robert, Culterallers Biggar

1880 Watt, John, Drumgray, Airdrie

1877 Weir, James, Sandilands, Lanark

1896 Willison, John, Parisholm, Douglas

1883 Wilson, Andrew, Dalzell, Motherwell

1888 Wilson, James, Westburn, Cambuslang

1877 Wingate, Andrew, Castlehill, Wishaw

1889 Wood, Alex, 8 & 10 Stockwell Street, Glasgow

1877 Wragg, Charles, 4 Stockwell Street, Glasgow

RENFREW.

1887 Alexander, P D, [illegible], Bridge of Weir

1884 Allan, David, M R C V S, Clarkston, Busby

1895 Ballantyne, William, Busbyside, Busby

1880 Bartlemore, William, Paisley

1897 Blackwood, Walter Aitkenhead Cathcart

1886 Blair, James, Bankfoot, Inverkip

1843†BLANTYRE, Lord, Erskine Glasgow

1857*BLYTHSWOOD, Lord, Blythswood, Renfrew

1884 Bryce, David, Abbots Inch, Paisley

1865 BURNS, Sir John, of Castle Wemyss, Bart, Wemyss Bay

Admitted

1893 Campbell, J M, Writer, Auldfield Place, Pollokshaws

1884 Clark, James, Burnside, Mearns

1884 Clark, William, Netherlea Farm, Cathcart

1893 Coats, Andrew, Ferguslie, Paisley

1868 COATS, Sir Thos Glen, Bart, of Ferguslie Park, Paisley

1850 Colquhoun, J, Corkerhill, Pollokshaws

1884 Crawford, John W, Greenock

1878 Cross, Alex, jun, Eastbank, Langbank

1881 Cross, David, Ingliston, Bishopton

1897 Cross, Thomas, Langbank, Renfrewshire

1880 Cuninghame, J C, of Craigends, Johnstone

1894 Dawson, Robert, Dovehill Pollokshaws

1882 Ferguson, A R, Writer, Neilston

1893 Ferguson, James A, Elderslie Estates Office, Deanside, Renfrew

1875 Ferguson, Peter, Rock Cottage, Renfrew

1897 Fleming Thomas Easter Farm, Busby

1883 Fleming, William, Fulwood, Houston

1897 Fulton Thomas, Shiels Renfrew

1868 Gairdner, Charles Brown, Newton Mearns

1857 Gilmour, Matt, Town of Inchinnan, Paisley

1857 Glegg, J, Factor, Milliken House, Johnstone

1897 Houston, Alex C, Wester Walkinshaw Paisley

1894 Houston, William F, V S Paisley

1875 Houstoun, Geo L, of Johnstone, Johnstone

1897 Howie, Robert, Netherauld House, Pollokshaws

1879 Howie William, Finnochbog Inverkip

1894 Hunter, Andrew, Braehead House, Cathcart

1857 Hunter, James, Braehead House, Cathcart

1865 INVERCLYDE, Lord, Castle Wemyss Wemyss Bay

1834 Jackson Jas, Carolside, Busby

1897 Jackson, John Whitemoss, Bishopton

1875 Jameson, Wm, Tighnamara Wemyss Bay

1897 Kidston, A Glen, Finlaystone, Langbank Renfrewshire

1897 Kidston George J of Finlaystone, Langbank, Renfrew

1897 Laing Alex A Garneyland, Inchinnan, Renfrew

1895 Lambie, James, Bonnington Moor, Eaglesham

1882 Locke Matthew Arthurlie Barrhead

1875 Love Alexander, Margaret's Mill, Kilmalcolm

1875 Macdowall, H, of Garthland, Lochwinnoch

1896 M'Intosh, Alexander, Greenhill Houston

1897 M'Kay, John, Crossmill Barrhead

1884 M'Kie, H B, Freeland Erskine

1897 M'Laurin, Arch, Cartside House Johnstone

1896 M'Meeken, James, Carnbooth, Busby

1885 Mactavish, D A, Solicitor, Johnstone

1897 Marshall, J C R, Crookfur, Newton Mearns

1889 MAXWELL, Sir John Maxwell Stirling, of Pollok, Bart, M P, Pollokshaws

1897 Morton, Robert Bogside Farm, Eaglesham

1890 Murray, J Campbell, Hagg's Castle, Pollokshields

1864 Myles, James, Deanside, Renfrew

1881 Park, Walter, Hatton, Bishopton, Renfrew

1853 Paterson, Jas, 32 Eldon Street, Greenock

1867 Peile, H R B, Mansion House, Greenock

Admitted
1897 Pollock, John, jun., Springside, Howwood
1873 Pollok, John, Paper Mill, Langside
1883 Pottie, Alexander, V.S., Paisley
1875 Ramsay, John, Butcher, Kilbarchan
1888 Reid, Colin, Castle Farm, Mearns
1882 Reid, Robert, Writer, Lochwinnoch
1888 Reid, William, Titwood Farm, Mearns
1896 Renshaw, Charles Bine, M.P., of Barrochan, Houston
1893 Richmond, Andrew, M.B., C.M., 9 St James Place, Paisley
1863 Riddell, David, Blackhall, Paisley
1880 Scott, A., 24 Mearns Street, Greenock
1882 Scott, James B., Ryeraes, Linwood
1894 Scott, William, Denniston, Kilmalcolm

Admitted
1898 Simpson, Robert, Johnstone, Renfrewshire
1891 Speirs, Alex. Archibald, of Elderslie, Houston House, Johnstone
1848 †STEWART, Sir M. R. Shaw, of Greenock and Blackhall, Bart., Ardgowan, Inverkip
1880 Taylor, William, Park Mains, Renfrew
1894 Thomson, Malcolm B., Park House, Renfrew
1888 Wallace, John, Broadlee, Neilston
1894 Wilson, James, Boghall, Houston
1883 Wilson, John, Erskine, Bishopton
1868 Wilson, Robert, Manswraes, Bridge of Weir
1883 Young, R. C., Netherfield, Paisley

2.—PERTH DISTRICT.

EMBRACING THE

COUNTIES OF FIFE, FORFAR (WESTERN DIVISION), KINROSS, AND PERTH (EASTERN DIVISION).

FIFE.

Admitted
1883 Aitken, George Lewis, Boghilly, Kirkcaldy
1868 Allan, James, Dysart
1875 Anderson, Charles, Kettykil, Leslie
1877 Anderson, David, Cassendilly, Cupar Fife
1883 Anderson, David A, Woodside House, Ladybank
1884 Anderson, James, Ferulea, Grieve Street, Dunfermline
1867 Anderson, W H, Anchor Lodge, Anstruther
1892 ANSTRUTHER, Sir R, of Balcaskie, Bart, Pittenweem
1885 Anstruther Duncan Mrs C H A of Naughton, Dundee
1862 Arnot, David, Friarton, Newport Fife
1886 Arnot, Thomas, Newton of Falkland, Falkland
1894 Auchmuty, George, Bowhouse of Wemyss, West Wemyss
1884 Auchterlonie, James, Dothan, Kirkcaldy
1844 Aytoun R S, of Inchdairnie, Kirkcaldy
1873 Baird, William, of Elie, Fife
1884 Balfour, Edward of Balbirnie, Markinch
1857 Balfour, Major F W, of Fernie Castle, Collessie
1890 Balfour, Francis, yr of Fernie, Fernie Castle, Collessie
1893 Balfour, Thomas C, Carberry, Leven
1893 Balfour, William, jun, Overstone, Pittenweem
1871 Ballingal, Neil, Sweetbank Markinch
1861 Ballingall, John, Dunbog, Newburgh
1890 Banks, James, Pitteddie, Kirkcaldy
1896 Barclay, Joseph D, V S, Dunfermline
1886 Baxter, Edward Gorrel, of Teasses, Largo
1891 Baxter, John Henry, of Gilston, Largo
1893 Bayne, James Muirhead, Freuchie
1856 Bell, David, Todhall, Cupar Fife
1893 Bell, George, Lundin Mill Largo
1880 Bell, John, Stenton St Monance
1893 Bell, P A, Pusk, Leuchars
1897 Bell, Robert, Upper Kenley, Boarhills, St Andrews
1890 Bell, Thomas, Todhall, Cupar Fife
1877 Bennet, Arthur, South Pitkinnie, Lochgelly
1896 Berry, Wm, of Tayport, Newport, Fife
1893 Berwick, Andrew, Hayston, Leuchars
1896 Berwick, P W, Ardross Elie
1848 Bethune, Alexander, of Blebo, Elie
1898 Beveridge, Chas H, Crombie, Dunfermline
1862 Beveridge, George, Kirkcaldy
1869 Beveridge, Jas, Crombie, Dunfermline
1872 Beveridge, William, of Bonnyton, Dunfermline

Admitted
1881 Beveridge, William, jun, Eastgrange, Dunfermline
1896 Birrell, James, Banbeath, Leven
1883 Black, James, Tullybreck, Markinch
1890 Black, John, Nether Pratis Leven
1889 Blyth, James, jun, Logie, Cupar Fife
1890 Blyth, William, Easter Kincaple, St Andrews
1879 Bonthrone, A, Newton of Falkland, Falkland
1895 Bonthrone, James, Farmer, Hayfield, Kirkcaldy
1898 Borrowman, James, V S, Cupar Fife
1898 Borthwick, W H, Lucklaw Hill, Leuchars
1887 Bowman, Geo M of Logie, Cupar Fife
1890 Bowman, James, Newark St Monance
1890 Braid John, Abercrombie St Monance
1893 Brewster John, Newhall, Crail
1891 Brown, Andrew, Rossie, Collessie
1894 Brown, Hugh, Colton Mains, Dunfermline
1876 Brown, John, of Colton, Dunfermline
1842 Bruce, John, W S, 8 Pilmuir Links, St Andrews
1889 Buttercase, Andrew, Uthrogle, Cupar Fife
1894 Butters Hugh, Masterton, Dunfermline
1894 Campbell, Duncan, Elie
1894 Carmichael, M I, Knockhill, Newport, Fife
1880 Carnegie, James, of Aytoun Hill, Newburgh
1869 Carswell, David, Blacketyside, Leven
1885 Carswell J H Straiton Leuchars
1868 Cartwright T R B Leslie Melville, Melville House, Ladybank
1886 Cathcart, James T, yr of Pitcairlie, Dunbog House, Newburgh
1857 Cathcart, R, of Pitcairlie, Newburgh
1883 Cheape, Captain G C, of Wellfield, Strathmiglo
1880 Cheape Mrs of Wellfield, Strathmiglo
1881 Cheape, J of Lathockar, Strathtyrum, St Andrews
1879 Christie, F W, Dairsie Mains, Cupar Fife
1890 Christie, James M, Scotscraig, Tayport
1874 Christie, John, Kirktonbarns, Tayport
1889 Clark, Alex, Chestnuts, Lundin Links
1871 Clark, Wm, 57 Cross Gate, Cupar Fife
1894 Clement, Jas, Balkaithly, St Andrews
1894 Clement, John, Clatto, St Andrews
1890 Constable, John, M D, Leuchars
1893 Cook, David, Luthrie, Cupar Fife
1892 Corstorphine, J E E, Inchyre Abbey, Newburgh, Fife
1897 Crabbie, Captain J (Scots Greys), Wemyss Hall, Cupar Fife

Admitted
1878 Craig, John, Craigencalf, Kinghorn
1894 Crichton, James, Boyne House, Ladybank
1879 Cunningham, David, Dalachy, Aberdour, Fife
1879 Cunningham, John, Burntisland
1883 Cunningham, T. D., Dronly, Cupar
1880 Curr, James, Knockhill, Newport, Fife
1894 Currie, Walter T., of Trynlaw, Rankeillor, Cupar-Fife
1881 Curror, Peter, Maltster, Kirkcaldy
1858 Dalgleish, L., Keavil, Dunfermline
1880 Davidson, George P., Blairhill, Dysart
1896 Davidson, James Scott, of Cairnie, Colinsburgh
1896 Davidson, Thos., Branxton and Cowdenlaws, Dysart
1899 Dawson, Charles Gordon, Colinsburgh
1894 Dickie, Alfred, Devon, Kennoway
1894 Dott, Robt., Muir Farm, Pathhead, Kirkcaldy
1898 Dow, James H., Muirton, Kirkcaldy
1873 Drummond, J., jun., Blacklaw, Dunfermline
1897 Drybrough, David, Orkie Farm, Freuchie
1869 Dryburgh, J., Kininmonth, Cupar-Fife
1861 Drysdale, Wm., of Kilrie, Kinghorn
1884 Dun, George, Easter Kincaple, St Andrews
1883 Duncan, John, of Kirkmay, Crail
1871 Duncan, John, Easter Balrymonth, St Andrews
1893 Duncan, Robert, Craigfoodie, Cupar-Fife
1885 Duncan, Thomas L., Pusk, Leuchars
1897 Edie, Harry Hay, Cornceres, Anstruther
1881 Elder, Hugh, Dunfermline
1875†ELGIN and KINCARDINE, the Earl of, Broomhall, Dunfermline
1860 ERSKINE, Sir Thomas, of Cambo, Bart., Kingsbarns
1893 Erskine, Colonel W., yr. of Cambo, Kingsbarns
1892 Fair, Alex., Pratis Farm, Leven
1898 Fair, David, Little Raith, Cardenden
1891 Fairlie, J. O. R., of Myres Castle, Auchtermuchty
1890 Farmer, A. Douglas, Kinkell, St Andrews
1884 Farmer, Robert, of Kingask, St Andrews
1882 Ferguson, R. C. Munro, of Raith, M.P., Kirkcaldy
1884 Fergusson, David, of Foxton, Cupar-Fife
1891 Ferrie, David, Parbroath, Cupar-Fife
1892 Finlay, Archibald, Markinch
1859 Finlay, John, Lochend, Lochgelly
1893 Finlayson, James, Beley, Stravithie
1893 Fleming, Andrew, Halltoases, Ceres
1873 Forgan, James, Sunnybraes, Largo
1894 Fraser, Robt., Middle Balbeggie, Kirkcaldy
1861 Fyfe, Robert, Wester Nether Urquhart, Gateside, Fife
1879 Fyshe, Jas., jun., Treaton, Markinch
1885 Galloway, John, of Seggie, Guardbridge
1871 Gibb, David, Bonnyhill, Anstruther
1893 Gibb, James, Easthall, Cupar-Fife
1898 Gibb, William G., Pitteuchar, Thornton
1877 Gibson, James, Whitehouse, Kirkland, Methil
1877 Gilchrist, Andrew, Carvenom, Anstruther
1871 Gillespie, Alex., Balmeadowside, Cupar-Fife
1841 Gillespie, D., of Mountquhannie, Cupar-Fife
1897 Gilmour, Harry, Montrave, Leven, Fife
1872†GILMOUR, Sir John, of Montrave, Bart., Leven—*Honorary Secretary of the Society*
1897 Gilmour, John, yr. of Montrave, Leven, Fife

Admitted
1890 Gilroy, George A., Rankeillour, Springfield, Fife
1887 Goodall, Thos., Cardenburns, Cardenden
1896 Gordon, Rev. Æneas G., The Manse, Kettle
1894 Gordon, T. P., Prize Poultry Farm, Thornton
1888 Gourlay, J. Murray, 1 Hope St., St Andrews
1887 Grace, Stuart, St Andrews
1899 Graham, George C., Wester Balrymonth, St Andrews
1870 Greig, James A., Kirkton Burntisland
1896 Grosset, J. E., Solicitor, Cupar-Fife
1869 Haig, H. V., of Ramornie, Ladybank
1871 Heggie, R. B., West End House, Kirkcaldy
1891 Henderson, A. L., Kingsdale, Kennoway
1884 Hepburn, James, Forth Bank, Kinghorn
1877 Hepburn, John, Kinghorn
1872 Hill, David, Upper Magus, St Andrews
1881 Hill, John, Langside, Kennoway
1893 Horn, David, Drumcarro, Cupar-Fife
1884 Husband, D., Struthers, Cupar-Fife
1891 Husband, Robt., Solicitor, Dunfermline
1893 Husband, Thos. R., Gellet, Dunfermline
1883 Hutchison, Alex., Ingleside, Kirkcaldy
1891 Hutton, John, Kilminning, Crail
1891 Inglis, James, Redhouse, Cardenden, R.S.O
1887 Inglis, John, of Colluthie, Cupar-Fife
1887 Inglis, R. T., Blinkbonny Lodge, Newburgh
1869 Irvine, Walter Douglas, of Grangemuir, Pittenweem
1895 Irving, John, Estate Office, Knockhill, Newport, Fife
1896 Jamieson, W., Estate Office, Elie
1876 Jamieson, W. T., Solicitor, Anstruther
1893 Jeffrey, Robt., Drumfin, Torryburn
1890 Johnston, John, New Inn, St Andrews
1877 Johnston, L., Sands, Kincardine-on-Forth
1882 Johnston, S. W., Fincraigs, Gauldry, Dundee
1898 Johnston, Wm., Allanhill, St Andrews
1899 Jones, Arthur W., Wester Gellet, Dunfermline
1890 Kay, Alex., Flass, Newport
1863 Kay, William, Inch Farm, Kincardine-on-Forth
1893 Kelloch, George, Balmerino, Newport
1865 Kidd, A. F., High St., West Aberdour
1893 Kidd, John, Ballindean, Kilmany
1859 Kininmonth, Peter, Collairnie, Newburgh, Fife
1884 Kinnear, John Boyd, of Kinloch, Collessie
1871 Kinross, Thomas, Wester Balbeggie, Kirkcaldy
1879 Knight, Robert, jun., V.S., Abbots House, Dunfermline
1899 Laing, John, Burnside, Auchtermuchty
1878 Landale, James, The Binn, Burntisland
1893 Lauder, Thos., St Nicholas, St Andrews
1896 Law, George P., Wester Pitscottie, Ceres
1896 Law, James, Spencerfield, Inverkeithing
1891 Lawson, Alex., of Burnturk, Annfield, Kettle
1890 Lawson, Henry Graham, Firthfield, Anstruther
1884 Lees, David, Pitscottie, Cupar
1897 Leitch, Richard G., Lochhead, East Wemyss
1897 Leitch, Robert, Townhill Coal Co., Dunfermline
1862 LESLIE, Hon. G. Waldegrave, Leslie House, Leslie
1896 Lesslie, William, Banchory, Kirkcaldy

Admitted
1898 Lindsay, John, Dams, Kingskettle
1889 Lochead, Matthew, Wester Balgarvie, Cupar-Fife
1896 Longmuir, Thomas, of Denork, St Andrews
1895 Lumsden, John Lawson, Freuchie
1854 Macdonald, Alex, of Edenwood, Cupar-Fife
1869 M'Farlane, James, Writer, Dunfermline
1890 M'Gibbon, John, Bankhead, Leven
1890 M'Gregor, James Fleming, 71 Market Street, St Andrews
1878 M'Intosh, Dr, University, St Andrews
1871 M'Naughton, William, North Lethans, Saline
1896 Maitland, F. L, of Lindores, Newburgh, Fife
1871 Maitland, Henry, of Balmungo, St Andrews
1879 Marshall, Walter, of Lochmaloney, Cupar
1898 Martin, Robert, Commercial Bank, Kirkcaldy
1896 Meiklejohn, Wm, Glen Newton Brewery, Falkland
1893 Meiklem, James, Begg, Kirkcaldy
1893 Meiklem, William, Begg, Kirkcaldy
1880 Meldrum, D B, of Kincaple, St Andrews
1859 Meldrum, J, of Eden Bank, Pittormie, Cupar Fife
1893 Melville, Thomas Robertson, Kettle
1875 Menzies, Fergus, Blackhall, Dunfermline
1897 Millar, George, Nydie Mains, St Andrews
1877 Millar, J, of Waulkmill, Dunfermline
1890 Miller, James Gilbert Starr, Cupar Fife
1870 Millie, George, St Mary s, Cupar Fife
1894 Mitchell, Alexander, of Luscar, Dunfermline
1898 Mitchell, John, Cleutrie, Kirkcaldy
1861 Mitchell, John, Fliskmiln, Newburgh
1859 Mitchell, Robert, 3 Bonnygate, Cupar Fife
1893 Morgan, John, Nocknary, Auchtermuchty
1878 Morrison, B G W, of Falfield, Cupar Fife
1890 Morton, David, Craighead, Crail
1894 Morton, John, Givan, Wormiston, Crail
1894 Moubray, Capt H H Carew, of Otterston, Aberdour
1890 Mudie, T E, Greenside, Largo
1875 Muirhead, T, Townhill Store, Dunfermline
1883 Nairn, M B, of Rankeillour, Springfield
1896 Nasmyth Alex Hogg, Middlebank, Dunfermline
1899 Nasmyth, Dr Thomas Goodall, Cupar Fife
1896 Ness, Walter, Potato Merchant, Freuchie
1896 Nicholson, William D, Ardross, Elie
1884 Nisbet, T M, Forthar, Kettle
1896 Normand, David, Dalginch, Markinch
1880 Normand, William J, Dysart
1873 Oliphant, T T, Queen Mary s, St Andrews
1892 Orchison, Alex, of Torr, Cupar Fife
1882 Osborne, David, Banker, Cupar Fife
1896 Ostlere, Edward, Ivy Lodge, Dysart
1896 Oswald, John, of Dunnikier, Kirkcaldy
1886 Page, Walter, Bogleys, Kirkcaldy
1859 Paton, John, Kirkness, Lochgelly
1898 Porter, James, Prinlaws House, Leslie
1864 Prentice, G, of Strathore, Thornton
1889 Purvis, Major A B, R.A, Kinaldy, Stravithy, R S O
1844 Purvis, John, of Kinaldy, Stravithy, R S O
1895 Ramsay, John, Inch, Pittenweem
1896 Readdie, Ebenezer Robert, Letham, Leven
1886 Reid, Andrew, V S, Auchtermuchty
1898 Reid, Robert, Arthurseat, Kingskettle
1878 Rigg James Home, of Tarvit, Cupar Fife
1893 Rintoul, Wm, Mains of Blebo, Cupar
1878 Roberts, J, Greenhead of Arnot, Leslie
1860 Robertson, Dr Charles, 16 Craigholm, Burntisland
1893 Roger, William, Kingsbarns
1891 Ross, Nicol, Cattle salesman, Dunfermline
1892 Rosslyn, The Earl of, Dysart House, Kirkcaldy
1859 Russell, David, Silverburn, Leven
1895 Russell, George, Cadham, Markinch
1869 Russell, James, of Kinsleith, Cupar Fife
1893 Scott, Douglas, Newton of Wemyss, Fifeshire
1896 Scott, George, Byresloan, Markinch
1893 Scott, John, Newton of Wemyss, Fifeshire
1894 Shepherd, William, Solicitor, Leven
1879 Sime, Alex, Dumbarnie, Largo
1897 Small, John, Westhall, Cupar Fife
1857 Small, L, of Foodie, Cupar
1886 Smith, Andrew, Hilltarvit, Cupar-Fife
1897 Smith, James, Cults, Pitlessie
1882 Smith, James T, Duloch, Inverkeithing
1886 Smith, Thomas, Inverdovat, Newport
1878 Smith, William, Mount, Cupar Fife
1870 Stark, Robert Kirkcaldy
1876 Stenhouse, J S, of Northfod, Dunfermline
1877 Stewart, Duncan, The Grange of Lindores, Newburgh
1892 Stewart, Hugh, Lumphinnans, Cowdenbeath
1894 Stewart, Wm, Ingrie, Leslie
1893 Stirling, John, Auchmuthy, Markinch
1890 Storrar, David, Land Surveyor, Cupar Fife
1891 Storrar, Richard, Pyestone, Markinch
1889 Syme John, Nether Strathkinness, St Andrews
1896 Terras, Thomas Hillside Ceres
1871 Thom, James, 7 Gow Crescent, Kirkcaldy
1875 Thom James F, Wellsgreen, Windygates
1879 Thom, R D, Pitlochie, Strathmiglo
1891 Thomson, Henry, Perceval, Buckhaven
1897 Thomson, James, jun, Humbie, Aberdour
1848†Thomson, Colonel John A, of Charleton, Colinsburgh
1896 Thomson, John R, Methilhill, Windygates
1877 Tod, James, Easter Cash, Strathmiglo
1873 Tulloch, James, Dales, Inverkeithing
1896 Tulloch, John B, Dales, Inverkeithing
1898 Turnbull, Jas, Randerston, Kingsbarns
1893 Turnbull, Mark, Randerston, Crail
1896 Waldie, Adam, Callange, Cupar Fife
1878 Walker, Arch, Banker, Auchtermuchty
187[illegible] Walker, Thos, Demperston, Auchtermuchty
1882 Wallace, George, Lebanon House, Cupar-Fife
1861 Wallace, James, Brake, St Andrews
1891 Wallace, John, Duniface, Leven
1880 Wallace, T A, Banker, Burntisland
1875 Wallace, Wm, Kincaple, Guardbridge
1891 Walls, Donald M, Grain Merchant, Dunfermline
1883 Walls, Robert, Grange, Burntisland
1892 Wardlaw, John, Tough Mill, Dunfermline
1893 Watson, Arthur, Kinnear, Leuchars
1873 Watt, Alex, 4 Home Park, Aberdour
1893 Watt, Frank M, Caldwell, Collessie
1882 Watt, W, Seed Merchant, Cupar-Fife

Admitted
1890 Webster, Thomas, Nisbetfield, Ladybank
1874 Wedderburn, H. S., of Wedderburn, Birkhill, Cupar
1884 Weighton, J. G., of Priorletham, St Andrews
1889 Wemyss, Alex. Watson, Denbrae, St Andrews
1872 Wemyss, R. G. E., of Wemyss, Kirkcaldy
1882 Wilson, Geo., Gladstone Cottage, Cupar
1892 Wilson, John Hardie, D.Sc., F.R.S.E., St Andrews—*Free Life Member*
1880 Wilson, P., Seed-crusher, Burntisland
1894 Wood, D. H., M.R.C.V.S., 62 High Street, Kirkcaldy
1877 Wood, Major William, Falkland
1859 Young, A., Kinloch, Collessie
1875 Younger, J. B. B. C., Balgrummo, Leven

FORFAR

(Western Division).

1882†Airlie, The Earl of, Cortachy Castle
1881 Alexander, John, Ballindarg, Kirriemuir
1874 Anderson, Alex., Berryhill, Dundee
1890 Andrew, James M., Magdalenes, Kirkton, Dundee
1853 Arklay, John, Seafield, Broughty Ferry
1871 Arnot, Wm., Glamis Mains, Glamis
1884 Auchterlonie, Alex., Viewbank, Coupar-Angus
1886 Ballingal, Hugh, Ardarroch, Dundee
1897 Barrie, Peter, St Mary's, Strathmartine, Dundee
1889 Batchelor, Francis M., Craigie, Dundee
1890 Baxter, George Washington, Ashcliff, Dundee
1890 Bell, Thomas, of Belmont, Dundee
1894 Bell, William, Balnuith, Dundee
1890 Bell, William Forsyth, Barns of Claverhouse, Dundee
1890 Berry, James, Merchant, Dundee
1876 Black, John, Cortachy, Kirriemuir
1899 Boyd, Charles, Solicitor, Coupar-Angus
1896 Brown, John G., Craighill, Dundee
1879 Bruce, Andrew, Jordanston, Meigle
1896 Bruce, William, Castle Street, Forfar
1867 Burr, Rev. P. Lorimer, D.D., Lundie Manse, Dundee
1861 Buttar, David, Corston, Coupar-Angus
1882 Buttar, Thomas A., Corston, Coupar-Angus—*Free Life Member*
1881 Cameron, James, Murthill Farina Works, Forfar
1871 Camperdown, The Earl of, Camperdown, Dundee
1896 Campbell, Wm., 191 Perth Road, Dundee
1890 Carmichael, James, Arthurstone, Ardler, Meigle
1858 Carnegie, W., yr. of Dunlappie, Coul, Forfar
1884 Clark, James, F.R.C.V.S., Abbeyhill, Coupar-Angus
1896 Clunie, George, Whitfield, Dundee
1898 Colville, James W., Morley Place, Forfar
1893 Cowans, David S., of West Mains, Auchterhouse, Dundee
1881 Cowpar, James, Hillbank, Kirriemuir
1898 Cox, Edmund C., Beechwood, Dundee
1890 Cox, Edward, of Cardean, Meigle
1882 Cox, Geo. M. (Messrs Cox & Co.), Dundee
[illegible]94 Crichton, And., Estate Office, Glamis
1890 Dewar, James C., Airlie Arms Hotel, Kirriemuir
1898 Dow, William, 18 Hawkhill, Dundee
1883 Duncan, John, Muirhouses, Kirriemuir
1879 Duncan, Patrick G., East Memus, Kirriemuir
1887 Duncan, Wm., Welltown, Coupar-Angus

Admitted
1881 Duncan, W. G., Balkemback, Tealing, Dundee
1895 Durkie, Alex. F., Mill of Mains, Dundee
1887 Farquharson, Alex., Greenburn, Coupar-Angus
1894 Fenton, David, Kingennie, Dundee
1879 Ferguson, Jas., Balunie, Coupar-Angus
1893 Fergusson, R. A., of Ethiebeaton, Dudhope Works, Dundee
1895 Forrest, James, Banker, Kirriemuir
1894 Fraser, H. E., Medical Superintendent, Royal Infirmary, Dundee
1890 Gardiner, Thomas J., Banchory, Coupar-Angus
1867 Gardyne, Col. C. G., Finavon, Forfar
1879 Graham, D. M., Auctioneer, Forfar
1890 Grainger, John, Pitcur, Coupar-Angus
1890 Grant, Alex., Corn Merchant, Forfar
1890 Grant, John, Craig Mills, Dundee
1881 Guild, Thomas, Herdhill, Kirriemuir
1896 Guthrie, John, Grain Merchant, Forfar
1890 Halkett, John Gilbert Hay, Balendoch, Meigle
1870 Hanning, J. J., 31 Tait's Lane, Dundee
1871 Harris, Wm., Commission Agent, Alyth
1878 Henderson. G. D. C., Captain R.N., of Invergowrie, Dundee
1890 Henderson, William, Milton of Collace, Coupar-Angus
1889 Hendry, Wm., Mains of Coul, Kirriemuir
1888 Hunter, Wm., Beech Tower, Broughty Ferry, Dundee
1890 Johnston, John, 14 St Clement's Lane, Dundee
1890 Kidd, David, West Ardler, Meigle
1896 Kininmonth, J. A., 48 Castle St., Forfar
1888 Kyd, Robert, Implement-maker, Coupar-Angus
1893 Laird, W. P., 73 Nethergate, Dundee
1894 Lindsay, Henry, Home Farm, Glamis
1896 Lowson, George, of Balgavies, Forfar
1890 Lyburn, John, Kinochtry, Coupar-Angus
1870 M'Farlane, William, 31 Benvie Road, Dundee
1865 M'Gavin, Robert, of Ballumbie, Dundee
1890 MacIntyre, Peter, Denfind, Monikie, Dundee
1890 M'Kay, Alexander, Mains of Auchterhouse, Lundie, Dundee
1891 Martin, Robert, Baldovie, Kirriemuir
1894 Maxwell, David, Upper Drumgley, Forfar
1870 Menzies, John C., Maritime Buildings, Dock Street, Dundee
1885 Menzies, W. D. Graham, Hallyburton, Coupar-Angus
1894 Mitchell, James, Nether Migvie, Kirriemuir
1886 Mitchell, William, Balnashanner, Forfar
1890 Murray, J. Douglas, 10 Windsor Terrace, Dundee
1891 Murray, Joseph, Dryburgh, Lochee, Dundee
1887 Myles, Rob., Coilamy, Cortachy, Kirriemuir
1867 Nicol, T. Monro, Littleton, Kirriemuir
1891 Nicoll, William, Carsebank, Forfar
1894 Ogilvy, John, Lisden, Kirriemuir
1871 Ogilvy, Sir Reginald H. A., of Inverquharity, Bart., Baldovan House, Dundee
1898 Ovenstone, Charles Barrie, Fairfield, Broughty Ferry
1890 Pattullo, David, South Gask, Coupar-Angus
1885 Pattullo, William, 19 St Andrew Street, Dundee
1893 Pattullo, William, Fullarton, Meigle
1849 Powrie, James, of Reswallie, Forfar
1880 Primerose, A. G., Dock Street, Dundee
1868 Ralston, Andrew, Glamis House, Glamis

Admitted
1898 Ralston, Claude L., Glamis
1896 Ralston, Gavin, Glamis House, Forfar
1899 Reich, Donald, Scroggiefield, Forfar
1876 Reid, George, Ladywell, Kirriemuir
1873 Reid, James, Kilmundy, Glamis
1897 Rennie, Wm., Petterden, Tealing, Dundee
1879 Ritchie, R. B., Accountant, Dundee
1890 Robertson, Alex., of Burnside, Forfar
1895 Robertson, John, Wharncliffe Estate Office, Newtyle
1890 Robertson, Wm. Brown, Dudhope House, Dundee
1862 Rogers, James S., Rose Mill, Dundee
1881 Rogers, Wm., Ph.D., Rose Mill, Dundee
1881 Ross, Wm., 93 Brook Street, Broughty Ferry
1896 Rough, William, Longbank, Kirriemuir
1890 Scott, George C., The Retreat, Perth Road, Dundee
1894 Scott, Jas., Suttieside, Forfar
1882 Scott, Robert, 56 Dundee Road, Forfar
1888 Sharp, Andrew, Norlands, West Albany Terrace, Dundee
1890 Sharp, John, Balmuir, Dundee
1883 Shield, J. T., Broughty Ferry
1890 Short, James, Royal Hotel, Coupar-Angus
1894 Sim, Jas., Kilnhill, Kirriemuir
1889 Smart, John B., Pitairlie, Monifieth, Dundee
1877 Smith, Thomas, Powrie, Dundee
1884 Smith, Thomas, Mains of Fowlis, Dundee
1890 Spreull, Andrew, V.S., Yeaman Shore, Dundee
1896 Steele, Thomas, Foulis Easter, Dundee
1894 Stewart, John F., Noranbank, Forfar
1893 Stewart, William, New Mill, Tannadice, Forfar
1891 Strachan, James, West Pilmore, Longforgan, Dundee
1867*†STRATHMORE, The Earl of, Glamis Castle
1890 Tasker, George, Arnbog, Meigle
1889 Tasker, William, East Camno, Meigle
1890 Thoms, Thomas S., Benvie, Invergowrie, Dundee
1893 Thomson, David Couper, 'Courier' Office, Dundee
1896 Thomson, Sam. C., Balmossie, Broughty Ferry
1881 Turnbull, George, Baldoukie, Tannadice
1880 Watson, Wm., Downicken, Dundee
1894 Webster, J. A., Commercial Bank, Forfar
1896 Webster, Patrick, of Flemington, Forfar
1881 Wedderspoon, George, Balgavies, Forfar
1868 White, John F., Craigtay, Dundee
1891 White, J. Martin, of Balruddery, Dundee
1861 Whitton, And., of Couston, Newtyle
1884 Whyte, Archibald, Inverquharity, Kirriemuir
1870 Whyte, Archibald, jun., Nether Hayston, Forfar
1890 Whyte, James, Upper Hayston, Glamis
1871 Whyte, John, West Denoon, Glamis
1868 Whyte, William, Spott, Kirriemuir
1893 Whyte, Wm., jun., Spott, Kirriemuir
1881 Wilkie, James, Solicitor, Kirriemuir
1896 Will, Alexander, Clepington, Dundee
1888 Willsher, George, Pitpointie, Auchterhouse, Dundee
1878 Wilson, T. Mackay, Solicitor, Kirriemuir
1897 Wyllie, William, Glasswell, Kirriemuir
1890 Young, John, Balmyle, Meigle

KINROSS.

1882 ADAM, Sir Chas. E., of Blair Adam, Bart., 5 New Sq., Lincoln's Inn, London, W.C.
1861 Anderson, Robert H., Tillyrie Cottage, Milnathort

Admitted
1893 Barclay, John, Pittendreich, Kinross
1898 Bayne, John, Game Dealer, Kinross
1868 Beath, David, Hopefield, Kinross
1873 Begg, R. Burns, Sheriff-Clerk, Kinross
1898 Bogie, John, Solicitor, Kinross
1896 Dawson, James A. Ramage, of Balado, Kinross
1886 Ewing, Francis, Bank Agent, Milnathort
1884 Flockhart, Wm., of Annacroich, Kinross
1884 Greig, Andrew, of Holeton, Milnathort
1883 Greig, John, of Tillyrie, Milnathort
1885 Hepburn, John, V.S., Milnathort
1878 Mitchell, Jas., Aldie Castle, Fossoway
1882 Montgomery, H. Jas., of Hattonburn, Milnathort
1862 Morrison, J. B. B., of Finderlie, Kinross
1896 Porteous, Colonel James, of Turfhills, Kinross
1871 Reid, George, of Tillyrie, Milnathort
1896 Rowat, Robert, jun., Orwell, Kinross
1881 Russell, T. Purves, of Warroch, Milnathort
1890 Simpson, Jas., of Mawcarse, Milnathort
1878 Simpson, Jas., North Lethans, Kinross
1884 Steedman, James, of Fruix, Kinross
1884 Steedman, Thos., Bank Agent, Kinross
1893 Taylor, William, Eastbank, Kinross
1873 Terris, J., jun., Dullomuir, Blair Adam
1870 Tod, Thos. M., of West Brackly, Kinross
1884 Tod, Wm., of East Brackly, Kinross
1874 Waddell, George, Lassodie Mill Colliery, Blair Adam
1877 Walls, James, Lochran, Kinross
1891 Young, Robert, Sunnyside, Kinross

PERTH

(EASTERN DIVISION).

1896 Adam, James, Braideston, Meigle
1893 Adamson, James, Grange, Errol
1896 Allan, John, Busby, Methven, Perth
1878 Allan, John, Culthill, Dunkeld
1887 Allan, William, Kinnon Park, Methven, Perth
1897 Anderson, A. B., County Club, Perth
1870 Anderson, Archibald Turnbull, Perth
1897 Anderson, Charles E., Cake and Manure Agent, Coupar-Angus
1878 Anderson, Peter, Duncaves, Fortingal
1871 Anderson, Robert, Balbrogie, Coupar-Angus
1896 Annand, William, Auctioneer, Alyth
1860*†ATHOLL, The Duke of, K.T., Blair Castle, Blair Atholl
1870 Ballingall, A. H., W.S., Perth
1896 Barnett, Thos., Wester Ballindran, Inchture
1893 Baxter, Wm., jun., Tophead, Stanley
1898 Bell, David Soot, Auchtertyre, Coupar-Angus
1887 Bell, James H., of Rossie, Forgandenny
1884 Bett, Thomas, Urlar, Aberfeldy
1884 Black, Captain, of Balgowan, Perth
1893 Boyd, James Laurence, of Glendouglie, Glenfarg
1883*†BREADALBANE, The Marquis of, K.G., Taymouth Castle, Aberfeldy
1871 Brown, Peter, Milton of Luncarty, Redgorton
1896 Browning, John M., Dupplin Gardens, Perth
1897 Bruce, George, of Rosefield, Balbeggie
1896 Bullions, John, Byres, Guildtown, Perth
1877 Butter, Albert, Union Bank, Perth
1895 Butter, Arch. Ed., of Faskally, Pitlochry
1894 Caird, Dr J. Hay, Carie, Rannoch
1871 Cairns, Robert, Bertha Park, Perth
1882 Calder, Jas., of Ardargie, Forgandenny

Admitted
1888 Cameron, Donald, Roro Moro, Aberfeldy
1887 Cameron, Duncan, Kinloch-Rannoch
1896 Cameron, John, Pepper Knowes, Glencarse, Perth
1892 Campbell, Alexander, Borland,-Fernan, Killin
1896 Campbell, Dun., Bonkle Cottage, Craigie, Perth
1887 Campbell, Lieut.-Col., General Prison, Perth
1896 Campbell, Major J. C. L., Royal Engineers, of Achalader, Blairgowrie
1896 Campbell, Peter, Kerrowmore, Glenlyon, Aberfeldy
1871 Chalmers, James, 11 Charlotte Street, Perth
1879 Chalmers, John, Westwood, Stanley
1897 Chalmers, Thos., 42 Tay Street, Perth
1896 Chalmers, Wm., New Mains of Fingask, Errol
1888 Chapman, Alexander, Wester Buchanty, Glenalmond, Perth
1890 Chisholm, Colin Edward, Grange of Elcho, Perth
1871 Chrystal, George, Engineer, Perth
1871 Clark, Robert, Taybank House, Errol
1896 Constable, Robert, Balledgarno, Inchture
1890 Cox, Albert E., of Dungarthill, Dunkeld
1890 Cox, Alfred W., Glendoick, Glencarse
1890 Cox, William Henry, yr. of Snaigow, Dunkeld
1896 CURRIE, Sir Donald, of Garth and Glenlyon, K.C.M.G., M.P., Garth Castle, Aberfeldy
1879 DALGLEISH, Sir Wm. Ogilvy, of Errol Park, Bart., Errol
1896 Davidson, William, Mavisbank, Perth
1894 Dewar, John A., Lord Provost of Perth
1896 Dickie, William B., Whitehills, Inchture
1846 Dickson, John, W.S., Greenbank, Perth
1871 Doe, John, Errol
1893 Donaldson, James, Gloagburn, Tibbermuir
1879 Dow, David, Balmanno, Bridge of Earn
1879 Dow, James, Clathybeg, Auchterarder
1865 Duff, James, Burghmuir, Perth
1878 Dunn, Wm., Kenmore Mains, Aberfeldy
1896 Dyce, William, Errol Park, Errol
1874 Fell, John Duncan, Flesher, Blairgowrie
1894 Fenwick, James, Kirkhill, Redgorton, Perth
1879†Ferguson, W. S., Pictstonhill, Perth
1879 Fergusson, Donald, Dalcapon, Ballinluig
1861 Fisher, Donald, The Hotel, Pitlochry
1881 Fleming, Rev. A., of Inchyra, Hamilton House, Perth
1897 Forbes, James, Denshaugh, Strathbraan, Dunkeld
1896 Forrest, T. L., Bankhead, Alyth
1892 Fotheringham, Walter Stewart, of Fotheringham and Murthly
1879 Fraser, John M., Auction Mart, Perth
1897 Frazer, John, Glenfoot, Abernethy, Perthshire
1874 Galloway, Alex., C.E., Dirgarbh, Aberfeldy
1890 Galloway, David, Grain Merchant, Perth
1884 Galloway, Thomas T., 41 Priory Place, Craigie, Perth
1884 Gammel, Colonel J. H. H., of Lethendy, Meikleour
1871 Geekie, R., of Baldowrie, Rosemount, Blairgowrie
1871 Gibson, Charles, Pitlochry
1896 Giersberg, Albert George, c/o Miss Graeme, Nurses Home, Perth
1875 Gillespie, Jas. J., St Colmes, Ballinluig
1896 Gilmour, William, Pitfour Brickworks, Glencarse, Perth

Admitted
1873 Gold, Joseph, Murthly Farm, Perth
1896 Goodall, William, Snaigow, Dunkeld
1887 Gow, Geo., Rannoch
1896 Graham, Alex., Ardargie Mains, Forgandenny
1881 Graham, A. G. Maxtone, yr. of Cultoquhey, Crieff
1897 Graham, A. M. B., Newton House, Glencarse
1896 Graham, Lt.-Col Henry Stewart Murray, of Murrayshall, Perth
1848 Graham, J. Maxtone, of Cultoquhey, Crieff
1896 Graham, James, Scones, Lethendy, Perth
1888 Grahame, John, Sheriff-Substitute, Newton House, Glencarse
1896 Graham, John, Tippermallo, Methven, Perth
1887 Grant, George, Tullyneddie, Blairgowrie
1879 Grant, John S., Tullymet, Ballinluig
1880 Gray, George, of Bowerswell, Perth
1896 Gray, James, Banker, Aberfeldy
1894 Gray, Thomas, Fingask, Rhynd, Perth
1861 Greig T. Watson, of Glencarse, Perth
1895 Greig, Thomas, yr. of Glencarse, Perth
1896 Grieve, William B., Merchant, Alyth
1871 Grimond, Alex. D., of Glenericht, Blairgowrie
1897 Guild, William, Little Downie, Buchanty, Perth
1871 Haggart, Peter, Breadalbane Mills, Aberfeldy
1896 Halley, Robert, Grain-merchant, Perth
1889 Hardie, David, Factor, Estates Office, Errol
1896 Harrower, William, Tomnacroich, Fortingall, Aberfeldy
1881 Hart, Andrew, Aberdalgie, Perth
1873 Hart, Wm., Nether Garvock, Dunning
1870 Hay, Alexander, Easter Cultmalundie, Perth
1890 Haynes, George G., Aberfeldy
1896 Henderson, Robert, Hillyland, Perth
1897 Hogg, Wm. H., Hallyburton Estate Office, Coupar-Angus
1894 Hollingworth, Thos., New Mains, Inchture
1896 Hope, Robert, jun., Huntingtower Mains, Perth
1897 Hopkinson, S. D., of Duncrievie House, Glenfarg (14 Campden Hill Road, London)
1893 Howieson, James, Rannagullzion, Blairgowrie
1894 Howison, Robert, East Inchmichael, Errol
1895 Hunter, John (of Hay & Co.), Fingask Perth
1871 Hunter, Patrick, Waterybutts, Errol
1882 Hutcheson, Andrew, Beechwood, Perth
1895 Hutcheson, William, Airleywight, Bankfoot
1893 Jackson, Thos. D., Live Stock Salesman Perth
1896 Jackson, Thos. C., Tullylumb, Perth
1897 Jameson, Henry, Claremont, Perth
1884 Jameson, Martin, Fernhill, Perth
1852 Jameson, Melville, Solicitor, Perth
1880 Jamieson, Alex., 31 Barossa Place, Perth
1880 Jamieson, John, 31 Barossa Place, Perth
1899 Japp, John, Middleton of Glenisla, Alyth
1890 Japp, William, of Broomhall, Alyth
1871 Johnston, James, Cattle-dealer, Perth
1871 Johnston, Stewart J., Loanleven, Huntingtower, Perth
1893 Keay, Peter, Marybank, Herriotfield, Logie Almond
1896 Keiller, J. Thomson, Caledonian Road, Perth

Admitted
1896 Keir, David, Ladywell, Dunkeld
1881 Kerr, Thomas, Forehill, Caputh
1894 Kidd, George, Drumkilbo, Meigle
1878 KINCAIRNEY, The Hon. Lord, Dunkeld (6 Heriot Row, Edinburgh)
1896 Kinloch, Charles Y., of Gourdie, Dunkeld
1877 KINLOCH, Sir John G. S., of Kinloch, Bart., M.P., Meigle
1879 KINNAIRD, Lord, Rossie Priory, Inchture
1896 KINNOUL, The Earl of, Dupplin Castle, Perth
1879 Kyd, George, Hilton, Perth
1896 Lamb, Alex., Freeland, Forgandenny
1896 Lamond, James, Inverqueich, Alyth
1857 Latham, P. R., Taybank, Caputh, Dunkeld
1894 Leslie, Thomas, Kinloch Arms Hotel, Meigle
1879 Livingston, John, Balarchibald, Ballechin, Ballinluig
1896 Love, Thomas, Auctioneer, Perth
1884 Lumsden, J. D., Huntingtowerfield, Perth
1884 Macdiarmid, Donald, Bank of Scotland, Aberfeldy
1875 M'Diarmid, Duncan, Camuscricht, Rannoch Station
1896 Macdonald, Alex., Craigraven, Kincarrathie, Perth
1855 Macdonald, Archd. Burns, Perth
1896 M'Donald, David, 23 York Place, Perth
1887 Macdonald, Duncan, Comrie Farm, Aberfeldy
1890 M'Donald, James, City Mills, Perth
1896 Macdonald, James, Craigraven, Kincarrathie, Perth
1895 M'Donald, J. M., Welton, Blairgowrie
1880 Macdonald, Montague, of St Martins, Perth
1871 Macdonald, William, "The Atholl," Pitlochry
1860 M'Dougall, Archd., Ardtalanaig, Perthshire
1896 M'Dougall, Donald, Claggan, Ardtalanaig, Killin
1871 M'Dougall, John, Goodlyburn, Perth
1874 Macduff, Alex., of Bonhard, Perth
1896 M'Duff, John, Balnacraig, Fortingall
1896 Macfarlane, John, Muir Lodge, Rannoch
1883 M'Gillewie, R., Union Bank, Dunkeld
1882 M'Gregor, Athole, Eastwood, Dunkeld
1872 Macgregor, Donald, Dalnabo Cottage, Ballinluig
1894 M'Gregor, Malcolm, Caledonian Road, Perth
1896 Mackendrick, William, 16 Marshall Place, Perth
1862 MACKENZIE, Sir Alex. M., of Delvine, Bart., Dunkeld
1895 Mackenzie, Capt., Balboughty, Perth
1890 Mackenzie, George A., Solicitor, Perth
1885 Mackenzie, R. W. R., Stormontfield, Perth
1897 Mackenzie, William A., Factor, Faskally, Pitlochry
1873 Mackie, J. H. J., Invermay, Forgandenny
1896 M'Kinlay, James, Balnahanaid, Glenlyon, Aberfeldy
1896 Mackinnon, John, Auctioneer, Blairgowrie
1896 M'Laggan, J. G., Woodburn Cottage, The Cairnies, Glenalmond, Perth
1897 M'Laren, A., Windyedge, Perth
1897 M'Laren, Alex., Auchnagie, Ballinluig
1879 M'Laren, Charles, Cally Lodge, Dunkeld
1896 M'Laren, John, Retreat House, Scone
1879 M'Laren, Wm., Pittendrigh, Meikleour
1880 MacLeish, Wm., Town-Clerk, Perth
1881 M'Leish, Dan., Wester Keillor, Methven

Admitted
1877 M'Leish, G. S., Wester Drumatherty, Dunkeld
1884 M'Leish, Jas., Byres of Murthly, Perth
1897 MacLeish, Bailie James, 15 Mill Street, Perth
1890 M'Millan, David, Calvine, Perthshire
1892 M'Naughton, Alex., Manufacturer, Pitlochry
1896 MacNaughton, James, Edrogoll, Aberfeldy
1896 MacNaughton, Peter, Remony, Kenmore
1898 MacRae, U. H. A., Dalchalloch, Calvine
1879 MacRitchie, David, of Easter Logie, Blairgowrie
1895†MANSFIELD, The Earl of, Scone Palace, Perth
1896 MARJORIBANKS, Hon. Coutts, Gourdie, Dunkeld
1887 Marshall, James Burt, of Luncarty, Perth
1896 Marshall, Robert, Wood-merchant, Killiecrankie
1885 Marshall, Robert, Denmarkfield, Perth
1887 Martin, Andrew, Montabor, Kinnoull, Perth
1896 Martin, H., Flowerdale, Collace
1895 Martin, James, Eastbank, Longforgan
1884 Matthew, John M., yr. of Auchmague, Perth
1887 Maxwell, William, of Donavourd, Pitlochry
1895 Meiklejohn, T. N., Estates Office, Murthly
1898 Meldrum, Rev. Andrew, Logierait Manse, Ballinluig
1841 Menzies, Fletcher Norton, Balmacneil, Ballinluig
1869 Menzies, Dr James, of Pitnacree, Ballinluig
1898 Menzies, John M., Camserney Cottage, Aberfeldy
1877 Menzies, Neil James, yr. of Menzies
1841†MENZIES, Sir Robert, of Menzies, Bart., Camserney, Aberfeldy
1893 Menzies, Robert, Millhaugh, Herriotfield, Logie Almond
1879 Menzies, Robert, Tirinie, Aberfeldy
1898 Menzies, Robert, Weem Hotel, Aberfeldy
1887 Menzies, Wm. J. B. Stewart, of Chesthill, Aberfeldy
1885 Middleton, Captain W. F., Baldarroch, Murthly
1895 Millar, David, Tullymoran, Logie Almond
1893 Millar, James Robert, Flawcraig, Errol
1887 Millar, Robert H., of Blair Castle, Culross
1896 Millar, William, Keillor, Coupar-Angus
1871 Millar, Wm., Over Kinfauns, Perth
1896 Miller, William, Woodhead, Aberdalgie, Perth
1890 Miller, George A., W.S., Perth
1893 Miller, William, jun., Durdie, Errol
1877 Mitchell, Hugh, Banker, Pitlochry
1882 Mollison, James, Ruthven, Meigle
1852 MONCRIEFF, Col. Sir Alex., K.C.B., F.R.S., Bandirran, Perth
1888 Moncrieff, R. H., Potterhill, W.S., Perth
1889 MONCREIFFE, Sir Robt. D., of Moncreiffe, Bart., Perth
1898 Morgan, Wm. F., Ardgaith, Glencarse
1896 Morrison, John, West Inchmichael, Errol
1896 Morton, David, North Muirton, Perth
1887 Morton, John, Muirton, Perth
1879 Morton, R. G., Engineer, Errol
1883 Munro, Chas., Union Bank, Aberfeldy
1895 MURRAY, Hon. Alexander David, Ardgilzean, Perth
1896 MURRAY, Hon. Alan D., Scone Palace, Perth

Admitted
1871 Murray, C. A., Taymount, Stanley
1896 Murray, David, Balgersho Works, Coupar-Angus
1891 Murray, John, B.Sc., Glenearn, Bridge of Earn—*Free Life Member*
1879 Nairne, T. G., Dunsinnan, Perth
1874 Nairne, William, of Dunsinnan, Perth
1896 Nicol, Alex., Breadalbane Arms Hotel, Aberfeldy
1896 Nimmo, Robt., 9 Pitcullen Crescent, Perth
1844 Ogilvy, Lieut.-Col. Thos. W., of Ruthven, Meigle
1896 Osler, James B., Coupar-Angus
1899 Panton, William S., Stormont Lodge, Blairgowrie
1880 Paton, Jas., Obney, Bankfoot
1893 Paton, Wm. B., Monorgan, Longforgan
1892 Paterson, Chas. J. G., of Castle Huntly, Longforgan
1893 Pattullo, T. M., Ashmore Farm, Blairgowrie
1896 Peddie, David, Forteviot Farm, Forteviot
1884 Philp, Alex., Mains of Duncrub, Dunning
1871 Pirrie, James P., Coachbuilder, Perth
1896 Pitcaithley, Alex., Jeanie Bank, Old Scone, Perth
1891 Pitcaithly, Geo., West Dron, Bridge of Earn
1877 Pople, George, Newhouse, Perth
1898 Prain, Alex. M., Rawes, Longforgan
1891 Provan, John, Wallacestone, Perth
1896 Pullar, Albert E., Duru, Perth
1897 Pullar, Charles, Munhall, Perth
1896 Pullar, Herbert S., Rosebank, Perth
1896 Pullar, James F., Rosebank, Perth
1871 PULLAR, Sir Robert, of Tayside, Perth
1896 Pullar, Rufus D., Brahan, Crieff Road, Perth
1884 Rae, W. A., Kingswood, Murthly
1871 RAMSAY, Sir James H., of Bamff, Bart., Alyth
1854 Rattray, Lieut.-Gen. J. C., of Craighall, C.B., Blairgowrie
1896 Reid, James, Coachbuilder, Princes St., Perth
1897 Reid, James, jun., Scone Road, Perth
1894 Rhind, John, Wester Kinloch, Blairgowrie
1896 RICHARDSON, Sir E. A. Stewart, of Pitfour, Bart., Glencarse, Perth
1890 Richardson, Colonel Edmund R. Stewart, of Ballathie, Stanley
1861 Richmond, John, Dron, Bridge of Earn
1879 Robertson, Alex., Ballechin, Ballinluig
1899 Robertson, Chas., Balnacree, Pitlochry
1893 Robertson, Daniel, Mains of Fordie, Dunkeld
1882 Robertson, Donald, Borlick, Dunkeld
1880 Robertson, E. W., of Auchleeks, Blair Athole
1876 Robertson, J. S., of Edradynate (Colquhalzie, Auchterarder)
1864 Robertson, John, Old Blair, Blair Athole
1896 Robertson, John, Meggernie Estate Office, Aberfeldy
1879 Robertson, Wm., of Craiglochie, Perth
1883 Robertson, Wm., Potato Merchant, Perth
1879 Robertson, Wm., Engineer, Perth
1883 Rollo, James A., County Club, Perth
1871 Roy, Thomas, Craigclowan, Perth
1897 Roy, William, Kirkton of Mailer, Perth
1896 Sandbach, C. Craigie, of Glendoick, Glencarse
1891 Sandeman, Lt.-Col. Geo. G., of Fonab, Pitlochry
1879 Scott, John, Eastertyre, Ballinluig
1883 Scrimgeour, Peter, Balboughty, Perth
1896 Scrimgeour, Thos., Halfway House, Errol

Admitted
1898 Seath, Alex., Breadalbane Estates Office, Kenmore, Aberfeldy
1891 Seaton, Donald, Cronan, Coupar-Angus
1890 Sellar, James T., W.S., Perth
1896 Sharp, James D., Letterellan, Fernan, Loch Tay
1896 Shaw, James, Estate Office, Dunalastair
1893 Sidey, David, Middle Gourdie, Dunkeld
1890 Sidey, James, 18 Pitcullen Crescent, Perth
1896 Simpson, James, Friarton, Perth
1889 Sinclair, John, Greenhill, Dunning
1859 Small, James, of Dirnanean, Pitlochry
1887 Smart, James, Architect, Perth
1896 Smith, David, Corsiehill, Perth
1891 Smith, James, Cranley, Meikleour
1896 Smith, John F., Eastfield, Bridge of Earn
1876 Smythe, Colonel David M., of Methven, Perth
1896 Soutar, Robert, Methven Street, Perth
1889 Speedie, Matthew, Pitversie, Abernethy
1881 Speid, James, Forneth, Dunkeld
1896 Stark, James, Coates of Fingask, Perth
1890 Stead, W. F., Ballindean House, Inchture
1880 Steel, Adam, of Blackpark, Perth
1896 Stephenson, John B., Broombarns, Forgandenny
1891 Stevens, A. B., Mains of Kilgraston, Bridge of Earn—*Free Life Member*
1893 Stewart, Alex. Blair, Balnakeilly, Pitlochry
1896 Stewart, Alex. Lodge, Logiealmond, Perth
1898 Stewart, Duncan, Mains of Balyonkan, Pitlochry
1896 Stewart, Edward G. M'K., Nether Logie, Meigle
1889 Stewart, Daniel, Muirhall, Perth
1870 Stewart, Donald, Clachan, Calvine
1881 Stewart, D. D., Castlehill, Inchture
1888 Stewart, H. D., Strathgarry, Blair Athole
1871 Stewart, James, Blair Athole
1876 Stewart, James, Woodside Farm, Coupar-Angus
1883 Stewart, J. F., Newmill, Stanley
1896 Stewart, Peter, Kirkton of Abernyte, Inchture
1896 Stratton, David, Clashigar, Logiealmond, Perth
1896 Stuart, David M., Merchant, Pitlochry
1896 STUART-GRAY, Hon. F. J., of Kinfauns, Perth
1893 Sutherland, William, Peel, Perth
1897 Tait, Rev. Walter, St Madoes, Glencarse, Perth
1878 Talbert, Peter, Glenericht, Blairgowrie
1896 Thom, James, Cambusmichael, Guildtown, Perth
1881 Thomson, Thos., Cordon, Abernethy
1896 Todd, James, Inchyra Manor, Glencarse, Perth
1896 Todd, William, Mains of Gartly, Methven
1896 Watson, W. L., Ayton House, Abernethy
1881 Wedderspoon, Thos., Live Stock Salesman, Perth
1892 Whitson, W., Isla Park, Coupar-Angus
1871 Whyte, Angus, Kipney Cottage, Harrietfield, Logiealmond, Perth
1884 Whyte, Wm., Muirhead, Forgandenny
1896 Wilkie, Alex., Pitlandie, Moneydie, Perth
1879 Wilkie, David, Market Hotel, Caledonian Road, Perth
1896 Wilson, James A., The Cairnies, Glenalmond, Perth
1873 Wood, C. L., of Freeland, Forgandenny
1894 Wynd, David, Newbigging, Errol
1894 Young, Robert, Dunkenny, Meigle

3.—STIRLING DISTRICT.

EMBRACING THE

COUNTIES OF CLACKMANNAN, DUMBARTON, PERTH (WESTERN DIVISION), AND STIRLING.

CLACKMANNAN.

Admitted

1880 Alexander, James, Inch of Fer[illegible]on, Clackmannan
1887 Alexander, William, Loanside, Clackmannan
1867 Arrol, Archd. T., Mill Grove, Alloa
1873†**BALFOUR** of Burleigh, Lord, Kennet, Alloa
1889 Blair, Charles, Glenfoot, Tillicoultry
1891 Cairns, John, Dollarbank, Dollar
1872 Christie, John, of Cowden, Dollar
1891 Clarke, John, Meadowhill, Clackmannan
1877 Crawford, John, High Street, Alloa
1892 Dobie, W. H., of Dollarbeg, Dollar
1890 Drysdale, William, King o Muirs, Alloa
1897 Forbes, Robert, Kennet, Alloa
1893 Gall, William, King Street, Alloa
1896 Haig, Alex. P., Blairhill, Rumbling Bridge
1886 Haig, Robert, Dollarfield, Dollar—*Free Life Member*, 1887
1875 Haig, W. J., of Dollarfield, Dollar
1878 Hart, Colonel, Blairlogie, Stirling
1858 Henderson, Robert, Nether Carsebridge, Alloa
1889 Kinloch, Charles, Dollar
1892 Kinross, D. A., Hillend, Clackmannan
1874 Knox, Robert, Woodside, Cambus, Alloa
1888 Lang, James, Aitkenhead Farm, Clackmannan
1889 Leishman, William, of Broomrigg, Dollar
1891 M'Laren, William, Longcarse, Alloa
1893 M'Leod, Geo., Land Steward, Harvieston Castle, Dollar
1893 M'Nab, Alexander, Middleton Kerse, Menstrie
1890 Mair, William, Gartary, Clackmannan
1890 **MAR and KELLIE**, The Earl of, Alloa Park, Alloa
1873 Moir, James M'Arthur, of Hillfoot, Dollar
1893 Norval, Alex., Solicitor, 38 High Street, Alloa
1875 Orr, James, of Harvieston, Dollar
1893 Peebles, James, Land Steward, Naemoor, Rumbling Bridge
1869 Robertson, Rev. A. Irvine, Clackmannan
1878 Simpson, James, Tower, Alloa
1881 Stirling, Robert, Parkhead, Alloa
1875 Thomson, Thomas, Bankhead, Alloa
1873 Young, George, Auctioneer, Dollar
1879 Younger, George, Brewer, Alloa
1889 Younger, James, Arns Brae House, Alloa

DUMBARTON

Admitted

1873 Anderson, John, Merkins, Alexandria
1897 Bauchop, John, Auchentulloch, Alexandria, N.B.
1897 Begg, Malcolm, Blairmle, Luss
1872 Brongan, A., Merchant, Helensburgh
1894 Brock, Hugh B. P., Bannachra, Alexandria, N.B.
1873 Buchanan, David, Garscadden Mains, Bearsden
1873 **BUCHANAN**, Sir Geo. H. Leith, of Ross, Bart., Alexandria
1861 Burns, J. W., of Kilmahew, Cardross
1857 Calder, James, Colgrain, Cardross
1885 **CAMPBELL**, Lady, of Garscube, Maryhill
1847 Campbell, J., of Tullichewan, Alexandria
1888 Campbell, J. A., Broomley, Alexandria
1889 Campbell, Wm. Middleton, of Colgrain, Helensburgh (23 Rood Lane, London)
1897 Collins, Hugh Brown, Garscadden, New Kilpatrick
1873 Colquhoun, George, Shemore, Luss
1872 **COLQUHOUN**, Sir James, of Luss, Bart., Rossdhu, Luss
1881 Cullen, William, Barbegs, Croy
1857 Dalrymple, James, of Woodhead, Kirk[illegible]
1895 Da[illegible]illiam, jun., Main Street, Alex[illegible], N.B.
1877 Dennistoun, J. W., Auchenlea, Row
1868 Douglas, Archd. C., of Mains, Milngavie
1881 Duncan, James, yr. of Auchendavie, Kirkintilloch
1881 Duncan, John, Auchenbee, Croy
1881 Duncan, Thos., Dullatur, Cumbernauld
1857 Ewing, Alexander Crum, of Strathleven, Dumbarton
1896 Ferguson Buchanan, G. J., of Auchentorlie, Bowling
1897 Ferrier, Alex., [illegible] Mill, Cardross
1880 Findlay, R. E., [illegible]oturich, Alexandria
1897 Fleming, Alex. J., Drumkinnon, Alexandria, N.B.
1872 Galbraith, John, Edentaggart, Luss
1893 Galloway, Thomas, of Glenlorum House, Bearsden
1869 Gilmour, John, Mount Vernon, Row
1881 Gilmour, William E., Woodbank, Alexandria
[illegible] Jack, John S., Adrigbank, Milngavie
187[illegible] Jardine, Andrew, Ballemenoch, Helensburgh
1899 Kippen, William James, of Westerton, Balloch
1854 Lang, William, Ledmore, Helensburgh

Admitted
1875 Lumsden, James, of Arden, Alexandria
1888 MacBrayne, David, yr. of Glenbranter, Auchenteil, Helensburgh
1873 Macdonald, John, Boquhanran, Dalmuir
1892 M'Farlan, Coll Jas. Turner, Stronafyne, Arrochar
1851 M'Farlan, John, Faslane, Garelochhead
1892 Macfarlan, Parlan, Faslane, Garelochhead
1873 M'Farlane, Colin, Strone, Glenfruin, Garelochhead
1878 M'Farlane, Duncan, Greenfield, Garelochhead
1872 M'Indoe, James, Glenmolachan, Luss
1865 Mackenzie, John, Letter Farm, Cove
1897 Mackenzie, Robert C., of Edenbarnet, Auchnacraig, Duntocher
1838 Mackenzie, Robert D., of Caldarvan, Alexandria
1878 Mackinlay, William, Ardoch, Cardross
1873 Maclachlan, Colin, Woodend, Helensburgh
1888 M'Lean, Thos., Banker, Alexandria
1872 M'Murrich, James, Stuckievullich, Arrochar
1882 M'Nab, Robt., Luss Hotel, Loch Lomond
1876 M'Nair, Robert, Westertown, New Kilpatrick
1857 M'Niven, Alex., Springbank, Helensburgh
1870 Merricks, Wm., 15 Regent Square, Lenzie
1884 Millar, James, Firkin, Arrochar
1883 Murray, David, LL.D., Moore Park, Cardross
1881 Park, Alex., Gartshore, Croy, Glasgow
1876 Robertson, R. W., Rockingham, Kilcreggan
1894 Russell, William, Helensburgh
1897 Snodgrass, James, Millig, Helensburgh
1897 Watkinson, Robt., Balloch Hotel, Balloch
1894 Weir, James, Woodilee Farm, Lenzie—*Free Life Member*
1882 Whitelaw, Alex., of Gartshore, Croy
1856 Young, James, Broadholm, Duntocher

PERTH

(WESTERN DIVISION).

1883 Anderson, A. H., Kippendavie Estate Office, Dunblane
1857 Ballingall, D., Factor, Blairdrummond
1873 Barty, James W., LL.D., Solicitor, Dunblane
1883 Blackett, J. S., Inverard, Aberfoyle
1861 Cairns, William, Bellhie, Auchterarder
1879 Campbell, Duncan, Dunderamh, Killin
1896 Campbell, James, Tullich, Killin
1871 Carrick, Charles, Baad, Stirling
1872 Carrick, T. A., Easter Cambusdrennie, Stirling
1881 Christie, Gilbert, Auchlyne, Killin
1882 Cochran, Wm., Overdale, Dunblane
1874 Colquhoun, Rev. J. E. Campbell, Ledcameroch, Dunblane
1896 Combe, Jas. Scarth, Blair Mains, Culross
1898 Corry, R. P., Ardveich, Lochearnhead
1882 Cox, George A., of Invertrossachs, Callander
1882 Cox, James C., Invertrossachs, Callander
1879 Craig, John, Innergeldie, Comrie—*Free Life Member*
1880 Craig, Wm., Corriennickloch, Amulree, Dunkeld—*Free Life Member*
1883 Crawford, Thos., Dumawhance, Crieff
1881 Crerar, Alex., Annfield, Callander
1871 Curr, Henry, Pitkellony House, Muthill
1897 Curr, Wm. Henry, W.S., Pitkellony House, Muthill
1864 Dewar, A., Arnprior, Port of Monteith

Admitted
1896 Dewar, Peter, Arnprior, Port of Monteith
1894 Dougal, James, Blaircessnock, Port of Monteith
1899 Dron, W. A., Crieffvechter, Crieff
1869†Drummond, Col. Home, of Blairdrummond, Stirling
1890 Duncan, Hector Macduff, yr. of Damside, Auchterarder
1876 Dundas, Chas. Henry, Dunira, Crieff
1882 Dundas, Colin M., Commander R.N., of Ochtertyre, Stirling
1894 Dunn, James, Doune
1864 Edington, Peter, Thornhill, Muthill
1873 Edmond, William, Kippendavie Mains Dunblane
1898 Ferguson, James, Glenartney, Comrie
1887 Fletcher, Angus, Auchtertyre, Tyndrum
1876 Forbes, Arthur Drummond, of Millearne, Auchterarder
1896 Gardiner, James, Rosemount, Auchterarder
1861 Gardiner, Robert, of Rottearns, Henhill, Forteviot
1896 Gilbert, T. Johnson, of Coldoch, Blairdrummond, Stirling
1884 Græme, Robert, of Garvock, Bridge of Earn
1897 Graham-Stirling, Captain C. Home, of Strowan, Crieff
1896 Gray, D. J. Thomson, Innerpeffrey Lodge, Crieff
1859 Grieve, Michael, Wolseley Park, Callander
1857 Grieve, Robert, Glenfalloch, Ardlui
1881 Hamilton, Alexander, Portend, Port of Menteith
1897 Hamilton, James, Fendoch, Crieff
1869 Hamilton, J. B. B., of Arnprior, Callander
1846 Hamilton, J. B., of Leny, Callander
1889 Holmes, James, Auchinteck, Dunblane
1884 Johnston, J. S., Fintalich, Muthill
1873 Kinross, Andrew, Hungryhill, Dunblane
1861 Kirk, James, Kaimknow, Muckhart
1882 M'Ara, Alex., Culdees, Muthill
1887 M'Callum, Wm. R., Ballig, Crieff
1896 M'Diarmid, James, Morenish, Killin
1881 Macdonald, John M. S., of Monachyle, Lochearnhead
1893 M'Dougall, John, jun., Benglass, Crianlarich
1890 MacEwen, Daniel, Merchant, Callander
1888 M'Ewen, John, Cambushinnie, Dunblane
1894 M'Ewen, John, Land-Steward, Thornhill, Muthill
1897 MacEwen, Wm., Cambushinnie, Braco, Perthshire
1897 Macfarlane, Andw., Chalmerston, Stirling
1891 Macfarlane, Charles, East Brackland, Callander
1896 Macfarlane, Duncan, V.S., Doune
1865 M'Innes, Duncan, Milton Cottage, Crieff
1893 Mackay, John, Brucehill of Cardross, Port of Monteith
1881 Mackie, Peter, East Kirkton, Auchterarder
1872 Maclachlan, James, Doune Lodge, Doune
1896 M'Laren, A., Dall, Ardeonaig, Killin
1898 M'Laren, William, Inch, Kincardine-on-Forth
1888 M'Laren, W. D., Drummore, Blairdrummond
1861 MacLean, Duncan, Belnollo, Crieff
1873 M'Murrich, Peter, Glen Allan, Dunblane
1878 M'Nab, John, M'Nab House, Callander
1871 M'Naughton, John, Inverlochlairg, Balquhidder
1879 M'Naughton, Robert, of Cowden, Comrie
1871 M'Rosty, James, Solicitor, Crieff

Admitted
1872 Marshall, W. H., of Callander (25 Heriot Row, Edinburgh)
1879 Menzies, James, Finlarig, Killin
1853 Millar, Hew, Newstead, Crieff
1899 Miller, John, Over Ardoch, Braco
1891 Mitchell, William, Blackdub, Stirling
1879 MORAY, Earl of, Doune Lodge, Doune
1882 Moubray, John Jas., of Naemoor, Dollar
1898 Muirhead, John, Brierlands, Stirling
1875 Murdoch, George Burn, Gartincaber, Doune—*Free Life Member*
1858 Murdoch, John Burn, of Gartincaber, Doune
1880 Murray, Anthony G., of Dollerie, Crieff
1873 Murray, John, Munnieston, Kippen Station, Stirling
1862 MURRAY, Sir Patrick Keith, of Ochtertyre, Bart., Crieff
1894 Newbigging, Alex., of Dalchonzie, Comrie
1852 Nimmo, Matthew, Baad, Stirling
1892 Pagan, John S., Braendam, Thornhill, Perthshire
1890 Paterson, James, Burnbank, Stirling
1882 Paterson, John, Kirkton, Tyndrum
1897 Paterson, John J., Inneshewan, Luib
1892 Paterson, Robert, Hill of Drip, Stirling
1893 Paton, Robt., Mosscot, Dunblane
1864 Reid, Walter, Craigarnhall, Bridge of Allan
1898 Renton, James, Burnbrae, Tulliallan, Kincardine-on-Forth
1861 Robertson, David, Allan Hill House, Dunblane
1879 Robertson, Donald, Cultoquhey, Crieff
1864 Robertson, D. G., of Torrie, Callander
1889 Rodger, James, Keir Estates Office, Dunblane
1896 Rogerson, James P., Tirarthur, Killin
1857 ROLLO, Lord, Duncrub House, Dunning
1883 ROLLO, The Hon. The Master of
1871 Ross, James E., Abercairny, Crieff
1898 Scott, John Alex., Kippendavie Estate Office, Dunblane
1890 Sharp, George R., Bardrill, Blackford
1881 Sharp, Jas. R., Viewfield, Blackford
1883 Sharp, John, South Forr, Crieff
1882 Sheppard, Rev. H. A. G., of Rednock, Port of Monteith
1895 Smeaton, T. W. Burgh, Easter Coull, Auchterarder
1870 Speir, R. T. A., Culdees Castle, Muthill
1875 Stark, M. C., Westerton Farm, Doune
1877 Stewart, Duncan, Callander
1888 Stewart, Col John, of Ardvoirlich, R.A., Lochearnhead
1895 Stewart, John, Bochastle, Callander
1882 Stewart, Joseph, Crianlarich, Stirling
1889 Stirling, Archd., of Keir, Dunblane
1880 Stirling, James, Whiteston, Braco
1879 Stirling, Col. Patrick, of Kippendavie, Dunblane
1882 Wallace, John, of Glassengall, Dunblane
1885 Watters, Thos., Glenample, Lochearnhead
1861 Williamson, Col. D. R., of Lawers, Crieff
1896 Willison, James, Acharn, Killin
1864 Wilson, Alex., Alford House, Dunblane
1875 Wilson, John, Lecropt, Bridge of Allan
1898 Wyllie, Thomas, Stockbridge, Dunblane

STIRLING.

1864 Aitken, John G., Southfield, Stirling
1878 Aitkenhead, Wm., Roughlands, Carron
1898 Alexander, John, Cornton Vale, Bridge of Allan
1875 Baird, Hugh, Auchenbowie House, Bannockburn
1876 Best, John, Inveravon, Polmont

Admitted
1877 Binnie, Thomas, Auction Mart, Falkirk
1882 Blair, Robert, Inversnaid Hotel, Loch Lomond
1886 Bolton, Edwin, West Plean, Bannockburn
1858 Bolton, J. C., of Carbrook, Larbert
1888 Brown, Charles, Kerse Estate Office, Falkirk
1882 Brown, John, Brownville, Kilsyth
1882 Brown, John A. H., of Quarter, Dunipace
1897 Buchan, Robert, Dalgrain, Falkirk
1897 Buchanan, Andrew C., Whitehouse, Stirling
1877 Buchanan, D. M. B., of Boquhan, Killearn
1877 Buchanan, John, Gartness, Killearn
1876 Buchanan, Robert, Blairquosh, Strathblane
1876 Buchanan, Robt., Lettre Farm, Killearn
1869 Bulloch, Archibald, Milliken, Maryhill
1882 Buntine, J. R., Sheriff-Subt., Stirling
1891 Cairns, William, Muirpark, Cambus
1882 Campbell, Capt. Henry J. Fletcher, R.N., Boquhan, Kippen, Stirling
1873 Christie, James, Coxethill, St Ninians
1894 Clarkson, Robert, Avondale, Polmont
1882 Couper, James, Craigforth, Stirling
1857 Dalgleish, John J., Brankston Grange, Bogside Station, Stirling
1895 Dallas, James, 13 Rosebery Place, Stirling
1894 Dempster, John, Logie Cottage, Airthrey, Bridge of Allan
1894 Dick, James, Ballinton, Kippen Station
1864 Douie, J. R. L., 10 Drummond Place, Stirling
1890 Drummond, James W., Seed and Nursery Establishment, Stirling
1891 Drysdale, John, Fairfield, Kippen
1885 Duncan, J. Dalrymple, Meiklewood, Stirling
1869 Edmond, David, of Ballochruin, Balfron
1881 Edmond, John, Galamuir, Bannockburn
1889 EDMONSTONE, Sir Archd., of Duntreath, Bart., Colzium, Kilsyth
1862 Erskine, H. D., of Cardross, Stirling
1882 Ewing, A. E. Orr, of Ballikinrain, Killearn
1897 Finlayson, Wm., Throsk, Stirling
1890 Fisher, Daniel, of Ballamenach, Bucklyvie
1864 Fleming, James, Carmuirs, Falkirk
1860† Forbes, William, of Callendar, Falkirk
1893 Fotheringham, Robt., Southfield, Kippen Station
1888 Fraser, John, Balfunning, Drymen
1880 Galbraith, J., Croy Cunningham, New Killearn Station
1873 Galbraith, T. L., Town-Clerk, Stirling
1897 Gillespie, W. W., Kersie Bank, South Alloa
1894 Graham, Donald, of Airthrey, Bridge of Allan
1894 Graham, Donald N., Airthrey Castle, Bridge of Allan
1894 Graham, Jas. D., Airthrey Castle, Bridge of Allan
1873 Gray, Andrew, West Plean, Bannockburn
1873 Gray, James, Kersie Mains, Stirling
1891 Gray, James, jun., Birkenwood, Gargunnock
1897 Grigor, John, Factor,' Sauchie Burn, Stirling
1872 Guild, And., Rhoders, Alva
1868 Hamilton, C. H., of Dunmore Park, Larbert
1858 Hannay, John, of Cairnhill, Stirling
1873 Henderson, A. W., Bridge of Allan
1898 Inglis, Alex., Kepdarroch, Gargunnock

Admitted
1891 Inglis, Robt., Patrickstone, Gargunnock
1881 Jaffray, William, Wester Barnego, Denny
1877 Jardine, Wm., Bogside, Fintry
1884 Kay, Andrew, Little Kerse, Kippen
1875 Kay, Charles, Mill Farm, Gargunnock
1881 Kay, Robert, Mains Farm, Gargunnock
1878 Ker, T. Ripley, of Dougalston, Milngavie
1868 King, C. M., Antermony House, Milton of Campsie
1857 KING, Sir James, of Campsie, Bart., Bothwell Castle, Bothwell
1894 Kinross, Henry (J. Gartshore & Sons, Grain Merchants), Grahamston
1864 Kinross, John, St Leonards, Causewayhead, Stirling
1897 Lander, Thomas Eaton, Arngomery, Kippen
1864 Lang, John, Beild, Gargunnock
1869 Learmonth, T. L., of Park Hall, Polmont
1884 Learmonth, Wm., Bowhouse, Grangemouth
1891 Lowe, P. R., Rockvale, Bridge of Allan
1873 M'Alpine, James, Springfield, Stirling
1873 M'Caull, Peter, Knockhill, Bridge of Allan
1857 M'Farlan, Lieut.-Col. John W., of Ballencleroch, Campsie Glen
1894 M'Farlane, Parlan, Shore Wharf, Stirling
1891 Macfarlane, James, Oxhill, Bucklyvie
1891 Macfarlane, Parlane, Darnley House, Queen's Road, Stirling
1886 Macfarlane, Robt. C., Greenburn, Doune
1864 M'Indoe, Robert, Lochbank House, Lennoxtown
1882 Mackay, John, Eagleton, Bridge of Allan
1891 M'Keich, William, Woodend, Bucklyvie
1889 Mackenzie, Robert, yr. of Caldarvan, Westerton, Bridge of Allan
1891 M'Kerracher, Daniel, Raploch, Stirling
1873 M'Lachlan, Archi., 32 Queen St., Stirling
1887 M'Laren, D., Cornton, Bridge of Allan
1891 M'Laren, James, Bandeath, Stirling
1885 M'Laren, J. T., Factor, Polmaise, Stirling
1898 M'Laren, Peter, Cornton, Bridge of Allan
1880 Malcolm, W. T., Dunmore, Airth Station, Stirling
1882 Melville, John H., Ernden, Falkirk
1890 Mitchell, David, Millfield, Polmont
1890 Moir, Alastair E. Graham, of Leckie, Gargunnock
1881 Moir, Alex., Nether Carse, Gargunnock
1876*†MONTROSE, The Duke of, Buchanan Castle, Drymen
1876 More, John, Fordhead, Kippen
1882 Morries-Stirling, J. M., Gogar, Stirling
1873 Morrison, James M., Banker, Stirling
1880 Morton, David, 1 Pitt Terrace, Stirling
1861†Murray, James, Catter House, Drymen
1863 Murray, Lt.-Col. Jn., of Polmaise, Stirling
1895 Murray, W. Watson, Catter House, Drymen
1873 Paton, John, of Viewforth, Stirling
1873 Patrick, James, Queenzieburn, Kilsyth
1895 Peareth, John Lennox, Lennox Castle, Campsie Glen, Stirlingshire

Admitted
1864 Philp, Robt., Royal Hotel, Bridge of Allan
1881 Pollock, J. J., of Auchineden, Strathblane
1887 Pullar, Edmund, Coneyhill House, Bridge of Allan
1883 Rankin, Robert, Inchterf, Kirkintilloch
1868 Rankine, R. W., Rosebank, Falkirk
1891 Rawding, George, Bridgehaugh, Stirling
1882 Rennie, James, Corrie, Kilsyth
1899 Rennie, William, Parkhead, Slamannan
1852 Ritchie, Wm., West Plean, Stirling
1873 Sands, James, Greenfoot, Gargunnock
1881 Scott, Rev. John, Camelon Manse, Falkirk
1884 Scott, Thomas, South Woodend, Bonnybridge
1872 Scoular, John, Crook, Stirling
1881 Slessor, Rev. Alexander, The Manse, Balfron
1893 Smith, James Kemp (Messrs Kemp & Nicholson), Stirling
1889 Speedie, John C., Stirling
1881 STEUART, Sir Alan H. Seton, of Touch, Bart., Stirling
1897 Stevenson, Arch., Golden Lion Hotel, Stirling
1882 Stevenson, John, Gateside, Denny
1879 Stewart, M. H. Shaw, of Carnock, M.P., Larbert
1868 STIRLING, Sir C. E. F., of Glorat, Bart., Milton of Campsie
1867 Stirling, James, of Garden, Kippen
1865 Stirling, Col. John S., of Gargunnock, Stirling
1897 Sutherland, Robert M., Wallside, Falkirk
1873 Taylor, James, Buchanan, Drymen
1890 Taylor, R., Craighead, Blairdrummond, Stirling
1877 Taylor, Robert, Solicitor, Stirling
1879 Thomson, James, Coach Works, Stirling
1897 Thomson, Robt., Queenshaugh, Stirling
1873 Thomson, William, Nyaad, Stirling
1881 Turnbull, James, Carnock Smithy, Larbert
1875 Ure, George, Wheatlands, Bonnybridge
1875 Ure, George R., Hope Park, Bonnybridge
1898 Wallace, T. Douglas, Callendar Estates Office, Falkirk
1873 Walls, Robert, Kerse Mills, Stirling
1890 Waters, J. C. Dun, of Craigton, Balfron
1877 Watson, John, Skipperton, Denny
1871 Waugh, Allan, Avonbridge, Falkirk
1864 Wilson, Alexander, Bannockburn House, Bannockburn
1881 Wilson, David, of Carbeth, Killearn
1864 Wilson, E. L., Bannockburn
1859 Wilson, John, of Auchineck, Killearn
1896 Wilson, John E., Burnside, Alva
1881 Wilson, William, Viewforth House, Bannockburn
1891 Wilson, William Ralph, Hill Park, Bannockburn
1891 Yellowlees, Robert, 16 Victoria Square, Stirling
1867 Young, Andrew, 4 Clarendon Place, Stirling
1873 Young, William, Taylorton, Stirling
1896 Yuille, Andrew B., Bellevue, Bridge of Allan

4.—EDINBURGH DISTRICT.

EMBRACING THE

COUNTIES OF EDINBURGH, HADDINGTON, AND LINLITHGOW.

EDINBURGH.

Admitted
1878 Adam, Robert, 2 Gilsland Road, Edinburgh
1859 Ainslie, David, of Costerton, Blackshiels
1848 Ainslie, John, 2 Greenbank Terrace
1865 Aitchison, Lieut.-Col., of Drummore, Musselburgh
1877 Aitken, Dr A. P., 8 Clyde Street
1854 Aitken, T., 11 Hope Street, Portobello
1860 Aitken, T., 5 Grosvenor Crescent
1889 Alexander, A., 64 St Andrew Square
1875 Allan, James, jun., 8 Oxford Terrace
1873 Allan, John, 22 St Albans Road
1892 Allan, Thomas, Clifton, Mid-Calder
1893 Allison, James, Claylands, Ratho
1881 Amour, John, Cramond Bridge
1877 Anderson, Charles, 377 High Street
1884 Anderson, J. R., W.S., 52 Palmerston Place
1884 Anderson, R. K., 377 High Street
1881 Anderson, W. M., Belmont, Dalkeith
1873 Andrew, Robert, 83 Haymarket Terrace
1855 Archbald, T., of Viewbank, Lasswade
1876 Archbald, T. B., 36 Craigmillar Park
1869 Archibald, James, Overshiels, Stow
1869 Archibald, John, Overshiels, Stow
1887 Armstrong, W. J., 57 Manor Place
1877 Auld, Peter, 31 Warrender Park Road
1894 Babington, William, 110 George Street
1893 Bailey, Col. F., Professor of Forestry, Edinburgh University, 7 Drummond Place
1894 Baird, Archibald, M.R.C.V.S., 40 York Place
1876 Baird, Colin C., V.S., Clyde Street
1879 Balfour, Professor I. B., Inverleith House
1861 Bathgate, James, Middleton Lime Works, Gorebridge
1875 Bayley, George, 7 Randolph Crescent
1882 Belfrage, A. J., Durham House, Portobello
1871 Belfrage, A. W., C.E. (of Colliston, Kinross-shire), 1 Erskine Place
1849 Belfrage, J., 40 Craigmillar Park
1895 Bell, David, 6 Bank Street, Leith
1895 Bernard, John Mackay, 25 Chester St.
1891 Black, A. D. M., W.S., 28 Castle Street
1862 Blackwood, William, 45 George Street
1874 Blair, John, W.S., 9 Ettrick Road
1879 Blair, Patrick, W.S., 19 Ainslie Place
1861 Blues, Andrew A., 8 North Mansion House Road
1899 Blyth, Benjamin Hall, C.E., 17 Palmerston Place
1846 Borthwick, John, of Crookston, Heriot
1897 Brand, David, 13 Royal Terrace
1857 Brockley, Robert M., Gourlaw, Rosewell
1848 Brodie, James C., 6 Dean Terrace
1890 Brodie, William Alex. G., 15 Rutland Square

Admitted
1897 Brown, Alex., Pinkie Mains, Musselburgh
1898 Brown, George Mitchell, 46 West Register Street
1881 Brown, Richard, C.A., 23 St Andrew Square
1892 Brown, Robert, Ormiston Villa, Kirknewton
1882 Brown, Wm., Currievale, Currie
1898 Brown, William, Gogarbank, Hermiston
1877 Bruce, E., 26 Greenside Place
1878 Bryce, And., Craigentinny, Edinburgh
1894 Bryden, Robert, 55 George Street
1853*†BUCCLEUCH and QUEENSBERRY, The Duke of, K.T., Dalkeith House, Dalkeith
1880 Buchan, Alex., LL.D., 42 Heriot Row
1862 Buchanan, Ben., Springbank, Corstorphine
1892 Buchanan, Charles, Land Steward, Penicuik
1872 Buchanan, John, C.E., 24 George Street
1894 Buchanan, Robert, Livingston Mill, Livingston, Mid-Calder
1884 Bain, C. M. P., Prestonfield House, Edinburgh
1838 Burnley, W. F., 24 Ainslie Place
1897 Burns, Andrew, Wester Norton, Ratho
1867 Burton, J. Tait, of Toxside, Gorebridge
1884 Byres, Wm., Baadsmill, West Calder
1878 Caird, Alex. M'Neel, 35 Howard Place
188 Cairns, Wm., Dairyman, Fountainbridge
1887 Callander, Henry, of Preston Hall, Dalkeith
1876 CAMPBELL, Sir Archd. S. L., of Succoth, Bart., 23 Moray Place
1889 Campbell, Arthur, 4 Randolph Crescent
1889 Campbell, George, W.S., 51 Castle Street
1895 Campbell, James, Illieston, Mid-Calder
1890 Campbell, P. W., W.S., 1 North Charlotte Street
1859 Carfrae, Geo., C.E., 1 Erskine Place
1893 Charters, John (Drummond Brothers), 17 Greenside Place
1887 Chiene, Prof., 26 Charlotte Square
1899 Chiene, Hall C., C.A., 67 George Street
1862 Christie, C. J., 6 Glenorchy Terrace
1884 Christie, Wm., Braemar, Whitehouse Terrace
1895 Clay, Alexander Thomson, W.S., 24 Charlotte Square
1854 Clay, John, 8 Magdala Crescent
1876 CLERK, Sir George Douglas, of Penicuik, Bart.
1894 Connell, Isaac, Secretary, Chamber of Agriculture, 52 Hanover Street
1884 Cook, Charles, W.S., 61 Castle Street
1882 Cook, Henry, W.S., 61 Castle Street
1892 Cook, James, Arniston, Gorebridge
1885 Cook, Wm. Home, C.A., 42 Castle Street
1865 Cousin, George, 140 Princes Street
1860 Cowan, C. W., of Logan House, Penicuik

Admitted
1898 Cowan, David, 22 St Andrew Square
1872 Cowan, George, Valleyfield, Penicuik
1858 COWAN, Sir John, of Beeslack, Milton Bridge
1879 Cowan, John, W.S., 12 Hill Street
1879 Cowan, John, 13 South St Andrew St.
1893 Cox, Charles T., W.S., 9 Buckingham Terrace
1892 Cox, Robert, of Gorgie, M.P., 34 Drumsheugh Gardens
1896 Crabbie, George, of Blairhoyle, 56 Palmerston Place
1863†CRAIG, Sir J. H. Gibson, of Riccarton, Bart., Currie—*Honorary Treasurer*
1877 Craig, Dr William, 71 Bruntsfield Place
1897 Craig, Wm. Cumming, 48 Moray Place
1883 Cranston, Robert, 28 Lauriston Place
1894 Crichton, David, 89 Princes Street
1849 Crichton, Hew Hamilton, W.S., 13 Nelson Street
1894 Crichton, Wm., Parduvine, Gorebridge
1858 Crombie, Alex., University Club, Princes Street
1883 Cross, Adam P., Bowling Green Street, Leith
1897 Cumming, Robert, 52 Hanover Street
1870 Cunningham, C., V.S., Slateford
1894 Cunningham, Lawrence, Thornbank, Juniper Green
1898 CUNYNGHAM, Sir Wm. Dick, of Prestonfield, Bart , 7 Melville Crescent
1873 Curror, P. R., Myreside, Edinburgh
1875 Dalgleish, Geo., Rosebery Mains, Gorebridge
1882 Dallas, D. F., S.S.C., 27 Charlotte Square
1862 DALRYMPLE, Sir Charles, of New Hailes, Bart., M.P., Musselburgh
1873 Dalziel, George, W.S., 66 Queen Street
1888 Dalziel, William, Muirhousedyke, West Calder
1896 Darling, Hon. Lord Stormonth, 10 Great Stuart Street
1877 Davidson, James I., Saughton Mains, Corstorphine
1850 Davidson, W. J., 32 Drumsheugh Gardens
1888 Davidson, W. S., 51 Castle Street
1896 Deans, John H., 62 Great King Street
1877 Dewar, James Cumming, of Vogrie, Ford
1883 Dewar, John R. W., V.S., Principal Dick Veterinary College, 8 Clyde Street
1893 Dick, Thomas, Wester Causewayend, Kirknewton
1884 Dickson, James, Damhead, Loanhead
1879 Dickson, T. G., 3 North St David Street
1878 Dickson, W. T., W.S., 11 Hill Street
1866 Dobbie, John M'Hutchen, Campend, Dalkeith
1898 Dobbin, Leonard, Ph.D., 7 Cobden Road
1889 Dods, Archd., Polton Farm, Lasswade
1884 Douglas, James, Cousland, Dalkeith
1858 Dowell, Alex., 13 Palmerston Place
1869 Downie, Hay, Corstorphine
1894 DRUMMOND, Sir James H. Williams, of Hawthornden, Bart., Lasswade
1884 Duncan, Peter, Eskbank, Dalkeith
1876 Duncan, William, S.S.C., 18 York Place
1887 Dundas, David, Advocate, 7 St Colme Street
1893 Dundas, Capt. Robert, yr. of Arniston, Gorebridge
1878 Dundas, Ralph, W.S., 16 St Andrew Sq.
1847 DUNDAS, Sir Robert, of Arniston. Bart., Gorebridge
1880 Dundas, William J., C.S., 16 St Andrew Square
1872 Dunlop, George, W.S., 20 Castle Street
1877 Dunn, Malcolm, The Gardens, Dalkeith
1858 Durie, David, 1 Queensferry Gardens
1878 Dykes, James, Cuicken, Penicuik

Admitted
1874 Edgar, John, Kirkettle, Roslin
1877 Elder, James, Rodinglaw, Currie
1892 Elder, Samuel, Whitehill Mains, Musselburgh
1867 ELPHINSTONE, Hon. E. B., Inveresk Lodge, Musselburgh
1898 ELPHINSTONE, Lord, Carberry Tower, Musselburgh
1876 Ferguson, Archd. A., 196 High Street, Portobello
1863 Ferguson, John, 9 Royal Crescent
1875 Fernie, James A., Smeaton, Dalkeith
1869 Finlay, John H., W.S., Register House
1873 Fisher, Donald, Whitehill, Rosewell
1890 Fisher, Thomas, Whitehill, Rosewell
1895 Fleming, C. J. N., Fettes College
1864 Fleming, James Nicol, 40 Drummond Place
1882 Fleming, Jas. S., 16 Grosvenor Crescent
1893 Fleming, John, Coates, Penicuik
1875 Fletcher, John D., 6 Barnton Terrace, Blackhall
1878 Ford, G., Saughton Hall Mains, Gorgie
1893 Ford, Jas., Saughton Hall Mains, Gorgie
1871 Forgan, Andrew, 10 Claremont Terrace
1863 Forrest, Peter, The Hird, Braid Avenue
1877 Foulis, David, 61 George Street
1868 Fraser, Alex., Canonmills Lodge
1894 Gardner, Adam, Melville Grange, Gilmerton
1855 Gardner, R., 12 Claremont Terrace
1877 Gardner, William, East Langton, Mid-Calder
1886 Garson, Wm., W.S., 5 Albyn Place
1887 Geddes, G. H., 21 Young Street
1892 Gibson, A. H., 5 Crawford Road—*Free Life Member*
1886 Gibson, Rev. John, 22 Regent Terrace
1895 Gibson, Thomas R., Bainfield Iron Works, Fountainbridge
1847 GILLESPIE, Sir John, W.S., 53 Northumberland Street
1890 Gilmour, Major R. Gordon, of Craigmillar, Edinburgh
1896 Glendinning, George E., Hatton Mains, Kirknewton
1869†Glendinning, G. R., Hatton Mains, Kirknewton
1874 Glendinning, J. P., Overshiels, Mid-Calder
1896 Glendinning, Patrick B., Hatton Mains, Kirknewton
1865 Goldie, R. G. M., 3 Comely Green Place
1893 Gordon, A. A., 1 Coates Gardens
1893 Graham, David, Leyden, Kirknewton
1861 Gray, James, Braehead Mains, Cramond Bridge
1884 Gray, James, Harperigg, Kirknewton
1878 Gray, Robert Smith, Southfield, Duddingston
1877 Greig, R. M., Fountainbridge
1889 Grey, John Edward, 20 Lauriston Place
1893 Guild, Alexander, Greenhead, Pencaitland (2 Thistle Court)
1877 Gulland, W. J., Monkton Hall, Musselburgh
1897 Guthrie, Patrick H., 4 Clifton Terrace—*Free Life Member*
1869 Hagart, J. V., W.S., 140 Princes Street
1864 Halkett, Lieut.-Col. J. C., of Cramond
1873 Hamilton, Robert, 18 Waterloo Place
1864 Hamilton, Wm., of Cairns, Kirknewton
1843 Handyside, W., 21 Magdala Crescent
1884 Harper James, Fordel, Dalkeith
1871 Harper, William, Sheriffhall Mains, Dalkeith
1862 Hay, James, 9 Castle Street
1893 Hay, Robert, Bailie, Huntly Street, Canonmills
1893 Henderson, Allan M., 4 Charlotte Place

Admitted
1876 Henderson, John, C.A., 40 Leamington Terrace
1899 Henderson, Robert, Craigie, Cramond Bridge
1862 Hendrie, John, 7 Murrayfield Avenue
1876 Herdman, B. A., West Pilton House, Davidson's Mains
1863 Higgins, Robert, 4 Garscube Terrace, Murrayfield
1899 Hill, James Barr Stevenson, Carlowrie, Cramond Bridge
1876 Hogg, Robert, 18 Ann Street
1880 Hogg, Thos., Oxenford Mains, Dalkeith
1858 Hood, Archibald, Rosewell
1878 HOPE, Sir Alexander, of Pinkie, Bart., Kingston Grange, Liberton
1848 Hope, Jas., of Belmont, Murrayfield
1877 Hope, James Edward, New Club
1864 Howe, Alex., W.S., 32 Charlotte Square
1877 Hunter, J., jun., Woodhall Mains, Juniper Green
1894 Hunter, John, 29 Chambers Street
1853 Hunter, Wm. B., Aracan Cottage, Musselburgh
1872 Hutchison, J. T., 12 Douglas Crescent
1875 Hutchison, Thos., Broomhills, Loanhead
1877 Inch, Robert, 1 Victoria Street
1869 Inglis, A. W., 30 Abercromby Place
1884 Inglis, H. H., W.S., 8 North St David St.
1899 Inglis, Joseph, W.S., 110 George Street
1887 Innes, John C., W.S., 32 Queen Street
1898 Irons, George Campbell, Spittal, Penicuik
1872 Jack, Gavin, Swanston, Lothianburn
1860 Jack, Samuel, Crichton Mains, Dalkeith
1869 Jack, Thomas, Hermiston, Currie
1885 Jameson, Andrew, 14 Moray Place
1860 Jamieson, G. A., C.A., 24 St Andrew Sq.
1874 Jamieson, J. A., W.S., 66 Queen Street
1858 Jamieson, Wm. H., 4 Danube Street
1869 Jeffrey, David, 14 Randolph Crescent
1880 Jenkinson, A. D., 10 Princes Street
1872 Johnson, W. H., Tweed Villa, Relugas Road
1852 Johnston, Alex., Hailes, Slateford
1894 Johnston, Henry, Advocate, 33 Moray Pl.
1862 Jones, Charles Digby, 12 Chester Street
1863 Kay, Wm., Broomieknowe, Lasswade
1893 Keith, Davidson, 65 George Street
1860 Kennaway, Robt., 10 Middleby Street
1888 Kerr, George, 6 St Colme Street
1889 Kerr, Thomas, W.S., 16 Hill Street
1872 King, James, West Mills, Colinton
1871 King, J. F., Chambers Street
1897 Kirk, W. J., 40 Palmerston Place
1896 Kirkwood, W. H., Lothian Bridge, Dalkeith
1896 Laidlay, Alfred Hope, 4 Eglinton Cres.
1877 Laing, Alex., S.S.C., 59 Manor Place
1874 Laing, William, 110 Easter Road, Leith
1893 Laird, Robert, 17 Frederick Street
1884 Lamond, Robert, Malcolmstone, Currie
1895 Lamont, James, 9 Howe Street
1899 Lauder, Alex., Goshen, Musselburgh
1877 Laurence, P., 50 Frederick Street
1872 Lawrie, John W., Ashbank, Gorebridge
1872 Lawrie, Thos., Esperston, Gorebridge
1878 Lee, A. H., 58 Manor Place
1863 Lee, John, 16 St Albans Road
1863 Lees, Richard, 45 Warrender Park Road
1878 Lindsay, Hugh, Glebe House, Dalkeith
1884 Lindsay, Robert, Kaimes Lodge, Murrayfield
1889 Lindsay, W. P., W.S., 16 Queen Street
1866 Lockhart, R., jun., 20 Polwarth Terrace
1884 Logan, C. B., W.S., 23 Queen Street
1872 Loney, Peter, 6 Carlton Street—*Free Life Member*, 1892
1874 Lothian, M. J., Redwood, Spylaw Road
1898 Loudon, John, Muldron, Fauldhouse

Admitted
1891 Lowe, W. D., W.S., 66 Queen Street
1889 Lowson, James G. F., Polton, Mid-Lothian
1872 Lyal, William, 7 Comiston Gardens
1859 Macadam, Dr S., Surgeons' Hall
1884 Macadam, Prof. W. Ivison, Surgeons' Hall
1874 McCallum, A. I., 19 Grassmarket
1864 M'Candlish, John M., 27 Drumsheugh Gardens
1869 M'Culloch, R. C., 15 Brougham Street
1883 Macdonald, James, 3 George IV. Bridge—*Secretary of the Society*
1886 Macdonald, R. B., Granton Mains, Edin.
1882 MacDougall, J. Patten, 39 Heriot Row
1870 M'Dowall, Andrew, Harelaw, Currie
1878 M'Dowall, T. N., Remote, Dalkeith
1862 Macfie, C., of Gogarburn, Corstorphine
1865 Macfie, D. J., of Borthwick Hall, Heriot
1893 Macfie, J. W., of Dreghorn, Colinton
1896 Macfie, R. A., Dreghorn, Colinton
1869 Macfie, Wm., of Clermiston, Corstorphine
1877 M'Gowan, Robert, 46 Fountainhall Road
1870 M'Gowan, William, 46 Fountainhall Rd.
1890 MacGregor, Donald, 45 Great Junction Street, Leith
1895 M'Harrie, Stair, Oxenford, Dalkeith
1884 Mackay, W. B., 17 Lennox Street
1869 Mackenzie, A. K., of Ravelrig, 19 Grosvenor Crescent
1879 Mackenzie, A. D., 6 Hartington Gardens
1884 Mackenzie, D. F., Morton Hall, Liberton
1848 Mackenzie, John, New Club
1879 Mackenzie, John, W.S., 16 Royal Circus
1848 Mackenzie, J. Ord, W.S., 9 Hill Street
1897 Mackenzie, Stewart, 37 Shandon Crescent
1892 M'Kinnon, George, Melville Castle, Lasswade
1896 Mackinnon, William, 144 Princes Street
1892 Maclagan, Philip R. D., St Catherine's, Liberton
1853 MACLAGAN, Prof. Sir Douglas, 28 Heriot Row
1873 Maclagan, R. C., M.D., 5 Coates Crescent
1896 M'Laren, J. D. M., c/o D. M'Laren & Co., Leith
1897 Maclean, A. D., 10 Greenhill Park
1897 M'Lean, Allan T. L., 62 Polwarth Terrace
1894 M'Leod, A. G., 48 Castle Street
1893 Macmillan, John, Corstorphine Hill House
1883 Macpherson, C. E. W., C.A., 6 North St David Street
1856 Macpherson, John, c/o Mrs Leighton, 5 Forbes Road
1893 Madder, J. W., 4 Elcho Terrace, Portobello
1896 Main, James, Corn Exchange Buildings
1880 Marshall, Rev. Theodore, 19 Coates Gardens
1874 Martin, J., 38 Lauriston Place
1867†Martin, John M. (late of Auchendennan), 32 Ann Street
1886 Massie, W. H., 1 Waterloo Place
1875 Mather, Edward, The Lee, Edinburgh
1899 Mather, Matthew, Silverknowes, Davidson's Mains
1869 Melrose, Patrick, Tower House, Tower Street, Portobello
1894 MELVILLE, Viscount, Melville Castle, Lasswade
1886 Melville, G. F., Moray Place
1863 Menzies, D., C.E., 39 York Place
1871 Menzies, Robert, S.S.C., 23 York Place
1870 Menzies, Wm. J., W.S., 123 George Street
1870 Merricks, H. J., The Retreat, Blackshiels
1884 Methven, John, 6 Bellevue Crescent
1892 Mettam, A. E., Veterinary College, 8 Clyde Street

Admitted
1882 Mill, George, 44 Frederick Street
1897 Millar, Thomas J., C.A., 30 York Place
1898 Milligan, J. M., 5 Royal Terrace
1883 Milne, Alex., 32 Hanover Street
1869 Mitchell, Wm., S.S.C., 11 South Charlotte Street
1892 Moffat, James, 48 Castle Street
1876 Moir, Peter, 74 Nicolson Street
1885 MONCREIFF, Hon. Jas. W., 6 Ainslie Pl.
1866 Moncrieff, D. S., W.S., 24 George Square
1884 Morton, Thomas, Redheugh, Gorebridge
1886 MORTON, The Earl of, Dalmahoy, Wilkieston
1887 Mungle, John T., West Calder
1891 Munro, Duncan, 3 Dalrymple Place—*Free Life Member*
1886 Munro, John C., yr. of Marchbank, Balerno
1880 Munro, William, of Marchbank, Balerno
1898 Murdoch, John, Rosemount, Eskbank
1870 Mure, Wm. J., New Club, Princes Street
1881 Murray, Captain A. B., 11 Grosvenor St.
1880 Murray, Lieut.-Col. C. S., 143 Warrender Park Road
1877 MURRAY, The Right Hon. A. G., Q.C., M.P., Lord Advocate, 7 Rothesay Ter.
1875 Murray, R. W. E., Blackford House, Blackford Avenue—*Free Life Member*
1857 Murray, Thomas, Braidwood, Penicuik
1890 Murray, T. M., W.S., 12 Lennox Street
1885 Murray, Wm. Hugh, W.S., 48 Castle St.
1890 Mylne, James, W.S., 36 Castle Street
1888 Naismith, R. T., 2 Ethel Ter., Plewlands
1893 Nisbet, Robert, Kingsknowes, Slateford
1847 Nisbett, J. M., of Cairnhill, Drum, Edinburgh
1860 Niven, A. T., C.A., 16 Young Street
1898 Noble, Eric Arthur, 4 Comely Bank—*Free Life Member*
1862 Norie, H. H., Union Bank, Edinburgh
1883 Oliver, James, 11 Claremont Terrace
1876 Ovens, William R., Leith
1874 Park, Ebenezer, Greenside Lane
1874 Park, William, Brunstane, Portobello
1889 Pate, Thomas, Windydoors, Stow
1864 Paterson, D. A., Merchant, Leith
1878 Paterson, James, of Bankton, Mid-Calder
1876 Paterson, J. T. S., Coltbridge House, Edinburgh
1877 Paterson, Richard L., Meadowspott, Dalkeith
1869 Paterson, Thos., W.S., 81A George Street
1890 Patten, Hugh, W.S., 42 Castle Street
1880 Paul, George M., C.S., 16 St Andrew Sq.
1897 Peet, John O., 5 Argyle Park Terrace—*Free Life Member*
1878 Pendreigh, George, Catcune, Gorebridge
1894 Penman, William, Assoc. M.I.C.E., Craigview, Marchhall Road
1893 Pitman, A. R. C., W.S., 48 Castle Street
1859 Plenderleith, Arch., Blackhope, Heriot
1894 Poole, Wm., Corn Exchange Buildings
1865 Prentice, R. R., 6 Mayfield Terrace
1899 Pretsell, James Damhead, Loanhead
1863 Pringle, D., Torquhan, Stow
1876 Pringle, J., 5 Tipperlinn Road
1881 Ramsay, R. G. Wardlaw, of Whitehill, Rosewell
1890 Ramsay, William, of Bowland, Stow
1874 Rankine, Prof. John, 23 Ainslie Place
1887 Readman, J. B., 4 Lindsay Place
1893 Reid, James, W.S., Drem, East Lothian (2 Thistle Court)
1888 Renwick, Andrew, East Pilton, Edinburgh
1879 Renwick, Wm., Meadowfield, Corstorphine
1871 Richmond, Thomas, Conservative Club, Princes Street
1877 Riddell, A., 5 Grassmarket

Admitted
1869 Ritchie, Charles, S.S.C., 20 Hill Street
1898 Ritchie, C. (T. Bernard & Co.), 15 Straiton Place, Portobello
1877 Ritchie, D., 69 Elm Row
1865 Ritchie, W., of Middleton, Gorebridge
1853 Ritchie, W., Woolmet, Dalkeith
1896 Robertson, Andrew, Kensworth Lodge, Polwarth Terrace
1884 Robertson, J. A., C.A., 33 Charlotte Sq.
1876 Robertson, Lieut.-Col. James C., United Service Club
1889 ROBERTSON, Rt. Hon. J. P. B., Lord Justice-General, 19 Drumsheugh Gardens
1873 Rodgie, Henry, St Clement's Wells, Musselburgh, N.B.
1893 Ross, Alex., Edinburgh Live Stock Mart
1886 Russell, A., Inchdrewer House, Colinton
1899 Russell, A. M., 29 Grassmarket
1893 RUSSELL, Sir James Alex., Woodville, Canaan Lane
1860 Rutherford, G., Monteath's Houses, Gorebridge
1887 Rutherford, Richard, V.S., Bread Street
1880 St Clair, J. S., Musselburgh
1864 Sanderson, Wm., Mount Lothian, Eskbank
1892 Sanford, Major Charles Henry, Beeslack, Milton Bridge
1875 Scott, Alex., 3 Bellfield, Portobello
1891 Scott, Rev. Arch., D.D., 16 Rothesay Place—*Chaplain to the Society*
1848 Seton, Geo., Conservative Club, Princes Street
1889 Shiells, James, Muirhouse, Stow
1898 Simpson, Mark F., Duddingston Farm, Portobello
1878 Simpson, Thomas, Duddingston Farm, Portobello
1874 Simson, C. S., 47 Queen Street
1869 Skinner, W., of Corra, W.S., 35 George Square
1846 Skirving, R. Scot, 29 Drummond Place
1886 Skirving, Thos. M., Niddrie Mains, Edin.
1899 Sloan, Bailie Thomas, 3 Hart Street
1877 Small, James, 7 Bruntsfield Crescent
1884 Smart, Alex., Bow, Stow
1880 Smart, J. C., 54 George Square
1893 Smith Sligo, Archibald D. (of Inzievar and Carmyle), 5 Drummond Place
1881 Smith, A. D., C.A., 4 York Place
1872 Smith, Dr G. P., care of P. Ronaldson, C.A., 3A North St David Street
1895 Smith, Harry Wedderburn, W.S., 21A Duke Street
1878 Smith, J., 89 Grassmarket
1867 Smith, J. Turnbull, LL.D., 5 Belgrave Place
1896 Smith, Stephen, 47 George Street
1884 Smith, Thomas H., National Bank, Edinburgh
1884 Smith, William, 1 Grassmarket
1893 Somner, George (Peter Lawson & Son, Limited), 1 George IV. Bridge
1893 Stark, James, 26 Earl Grey Street
1895 Stedman, James, jun., Middletoun, Mid-Lothian
1870 Steel, General G. Mure, c/o Messrs John Taylor & Sons, 110 Princes Street
1861 Stenhouse, Jas., Turnhouse, Cramond Bridge
1899 Stenhouse, John Robert, South Gyle, Corstorphine
1898 Steuart, James Arch., Dalkeith Park, Dalkeith
1884 Steuart, J. H., Selms, Kirknewton
1893 Steuart, Thomas Elis, Stellknowe, Leadburn, and 48 Palmerston Place
1886 Stevenson David Alan, C.E., 84 George Street
1881 Stewart, G. M. F., 10 Oxford Terrace

Admitted
1893 Stewart, James Robert Hunter, 4 Albyn Place
1894 Stewart, William, Dalhousie Castle, Bonnyrigg
1893 Stockman, Stewart, M R C V S, 8 Clyde Street
1878 Stodart, J A., Broomvale, Broomieknowe, Lasswade
1851 Stodart, John, Calderwood Bank, Lasswade
1890 Stoddart, James Edward, of Howden, Mid Calder
1878 Strathern, Robt, W S, 12 South Charlotte Street
1865 Sutherland, Jas B, S S C, 10 Windsor Street
1858 Swan, James, Haymarket
1858 Swan, Thomas, Haymarket
1889 Sydserff, John Buchan (Ruchlaw), National Bank, 142 Princes Street
1874 Syme, David, 1 George IV Bridge
1876 Symington, Jas, 20 St Albans Road
1893 Taylor, J. Pringle, Dunsmure, Corstorphine
1893 Taylor, Jas (Easter Drylaw), Bangholm House, Ferry Road, Edinburgh
1884 Taylor Peter, Lochend
1872 Taylor, Thos, Seed Merchant, Dalkeith
1893 Tennent, David B Clark, 103 George St
1884 Thin, John, Ferniehirst, Stow
1874 Thoms, George Hunter, 13 Charlotte Sq
1889 Thomson, George Munro, W S, 123 George Street
1858 Thomson, James, 53 George Street
1895 Thomson, James, yr of Glenpark, Balerno
1895 Thomson, James Wishart, of Glenpark Balerno
1870 Thomson, Lockhart S S C, 114 George Street
1873 Thomson Mitchell, 9 South St Andrew Street
1859 Thomson, Peter, Conservative Club, Princes Street
1888 Thomson, Robert, Rusha, West Calder
1884 Thorburn, David, Brockhouse, Stow
1896 Thornton, Robert Hermand, West Calder
1869 Tod, James C, Currie
1870 Tod, John W W S, 66 Queen Street
1876 Todd, David, 2 Dick Place
1865 Todd, Jas, 2 Morningside Gardens
1893 TORPHICHEN, Lord, Calder House, Mid Calder
1871 Torrance, Archibald P, Viewfield, Lasswade
1877 Torrance, T A, Camps, Wilkieston
1894 Torrance, T A, Kippielaw, Dalkeith
1865 Trotter, Coutts 10 Randolph Crescent
1865 Trotter, General H, of Morton Hall, Liberton
1898 Trotter, John, 376 Castlehill—*Free Life Member*
1878 TUKE, Dr Sir J B, Saughton Hall
1896 Tullo, James, 2 Hanover Street
1874 Turnbull, David, W S, 5 South Charlotte Street
1868 TURNER, Prof Sir W, 6 Eton Terrace
1873 Tweedie, A G, 50 Blacket Place
1898 Tytler, James William Fraser-, of Woodhouselee, Mid Lothian
1896 Usher, Frank James, Norton, Ratho Station
1893 Usher, Frederick, Norton Mains, Ratho
1885 Usher, John, of Norton, Ratho
1864 Veitch, Chris, 11 Rothesay Place
1874 Waddell, A Peddie, 6 Albyn Place
1888 Waddell, George, 4 St Andrew Square
1857 Wakelin, John, Oil Mills, Musselburgh
1877 Walcot, John, Craiglockhart Hydropathic, Slateford

Admitted
1870 Walker, Alexander, Stagebank, Heriot
1895 Walker, Graham W, Redheugh, Gorebridge
1860 Walker, James, of Dalry, Hanley Corstorphine
1898 Walker, Robert, East Craigs, Corstorphine
1882 Walker, R H, of Hartwood, West Calder
1893 Wallace, John William, of Shoestanes (3 Bernard Street Leith)
1878 Wallace, Prof Robert, University, Edinburgh—*Free Life Member*
1858 WARRENDER, Sir G, of Lochend, Bart, Bruntsfield House
1869 Watherston, James, 29 Queensferry St
1882 Watson, Adam, 23 Union Street
1898 Watson Gilbert Woodburn Terrace
1882 Watson, G G, W S, 32 Albany Street
1878 Watson Jas Graham 22 Learmonth Ter
1864 Watson, John Kingsbeck, Cluny Drive
1884 Wauchope, Major General A S, of Niddrie Marischall C M G, Liberton
1882 WAUCHOPE, Sir J D, of Edmonstone Bart 12 Ainslie Place
1884 Weir, W C Middleton, Gorebridge
1886 Welsh, W M, 1 Waterloo Place
1877 Welwood, J A Maconochie, Meadowbank House, Kirknewton
1884 Worley Jas A, 5 Drumsheugh Gardens
1876 White James, Stagehall Stow
1872 White, Robert, Springwood Park, Liberton
1893 White, Samuel, Lugate, Stow
1896 Whitelaw Robert H (T Bernard & Co), 27 Brighton Place Portobello
1898 Wight, Geo, Suffolk House, Suffolk Rd
1884 Wight, Robert, Suffolk House, Suffolk Road
1884 Wilkie, Captain W of Ormiston, Kirknewton
1878 Will, Robert W S S C, 37 Queen Street
1867 Williams, W Principal, New Veterinary College Leith Walk
1881 Williams, W O New Veterinary College, Leith Walk
1870 Wilson, P, c/o Miss Munro, 3 Summer Place
1858 Wilson, Richard, C A, 28 Great King Street
1897 Winter, Lt Col S H, A S C, D A A G, 1 Castle Terrace
1897 Wishart, D F jun 18 Picardy Place
1894 Wood, John Phillip W S, Professor of Conveyancing University of Edin
1890 Wylie James, Royal Bank, 1 Leven St Edinburgh
1884 Wyllie, Alex, 56 Great King Street
1854 YOUNG, Hon Lord, 28 Moray Place
1888 Young, David, of the *North British Agriculturist*, 377 High Street
1876 Young, John, St Margaret's, Wester Duddingston
1896 Young, John, Straiton, Loanhead
1898 Young, Robert (James Young & Sons), 18 Polwarth Terrace
1887 Younger, George, 4 Douglas Gardens
1870 Younger, Henry J, Abbey Brewery
1863 Younger, Robert, 15 Carlton Terrace
1894 Younger, William, 29 Moray Place

HADDINGTON.

1882 Ainslie, John, jun, Temple Hall, Ormiston
1859 Anderson, G B, Meikle Pinkerton, Dunbar
1873 Anderson, W W, of Kingston, North Berwick

Admitted
1892 Baillie, Wm., Nurseries, Haddington—*Free Life Member*
1860 BAIRD, Sir David, of Newbyth, Bart., Prestonkirk
1868†BALFOUR, Right Hon. A. J., of Whittinghame, M.P., Prestonkirk
1888 Bayley, Isaac F., Halls, Dunbar
1893 Bertram, Andrew, Townhead, Gifford
1898 Binnie, Wm. A. G., Birnieknowes, Cockburnspath
1892 Blair, Thomas, Hoprig Mains, Macmerry
1872 Brand, James, Dunbar
1880 Bridges, Andrew, Engineer, North Berwick
1868 Broadwood, T., Crowhill, Innerwick
1884 Calder, Robt., Cairndinnies, Haddington
1864 Clark, James, Kirklandhill, Dunbar
1893 Clark, John, Wamphray, North Berwick
1880 Clark, Thomas, Oldhamstocks Mains, Cockburnspath
1896 Cockburn, David, Castleton, North Berwick
1889 Connor, G. A., Craigielaw, Longniddry
1897 Cook, Chas. W. L., Wester Pencaitland, Pencaitland
1886 Courtney, Wm., Portobello Farm, Tranent
1893 Cree, W., of Gifford Bank, Gifford
1891 Crosbie, Alexander, of Blegbie, Upper Keith
1883 Cunningham, St Clair, Hedderwick Hill, Dunbar
1895 Curr, William Simpson, Ninewar, Prestonkirk
1883 Darling, James, Priestlaw, Duns
1872 Dewar, David, Murrays, Ormiston
1895 Dobbie, Æmilius S., East Fenton, Drem
1877 Dodds, Samuel, Sommerfield, Haddington
1884 ELCHO, Lord, M.P., Gosford, Longniddry
1890 Elder, James, Haddington
1890 Elder, Thomas, Stevenson Mains, Haddington
1884 Elliot, Walter, Pitcox, Dunbar
1857 Fletcher, J., of Salton, Pencaitland
1849 Ford, Wm., Fenton Barns, Drem
1877 Fyshe, Peter, Newtonlees, Dunbar
1859 Gaukroger, G., Southfield, Longniddry
1883 Gemmell, Wm., Greendykes, Macmerry
1889 Gillespie, William, Athelstaneford, Drem
1855 Gray, Wm., Brownrigg, North Berwick
1882 Gray, W. W., of Nunraw, Prestonkirk
1876 Greenshields, T. A., Windymains, Salton
1893 Gregor, Charles E., Innerwick, East Lothian
1857*†HADDINGTON, The Earl of, Tyninghame, Prestonkirk
1859 Haldane, Robt., Phantassie, Prestonkirk
1878 HALL, Sir Basil F., of Dunglass, Bart., Cockburnspath
1872 Handyside, J. B., Fenton, Drem
1875 Hay, Alex., Gifford Vale, Haddington
1862 Hay, Captain J. G. Baird, of Belton, Dunbar
1885 Henderson, George, Upper Keith
1893 HEPBURN, Sir Archibald Buchan, of Smeaton, Bart., Prestonkirk
1886 Hope, Harry, Barneyhill, Dunbar
1865 Hope, Henry W., of Luffness, Drem
1847 Hope, James, East Barns, Dunbar
1878 Hope, William James, East Barns, Dunbar
1893 Horn, Wm., of Woodcote Park, Blackshiels
1877 Houston, M. H., of Beechhill, Haddington
1887 Hunter, Richard, of Thurston, Dunbar
1898 Inch, John, Congalton, North Berwick
1884 Kerr, John, Barneymains, Haddington
1878 King, William, jun., Wolfstar, Ormiston

Admitted
1859 KINLOCH, Sir Alexander, of Gilmerton, Bart., Drem
1885 Kinloch, David A., yr. of Gilmerton, Guards' Club, London
1898 Kinnaird, Andrew, The Grange, Garvald, Prestonkirk
1878 Lawrie, Jas. D., of Monkrigg, Haddington
1893 Lee, Joseph, Markle, Prestonkirk
1870 M'Culloch, D., Bank Agent, North Berwick
1864 M'Ewen, J., Redside Farm, North Berwick
1877 Mark, John, Sunnyside, Prestonkirk
1897 Muirhead, Jas., Spittlerigg, Haddington
1870 Murray, David, Quarryford, Gifford
1871 Nelson, Charles, Skateraw, Innerwick
1898 Nicholson, W. L., Saltcoats, Gullane
1890 Nisbet, C. C., of Stobshiel, Upper Keith
1889 Ogilvy, H. T. N. Hamilton, Biel, Prestonkirk
1899 Pace, Ferrier, Ormiston Mains, Ormiston
1893 Park, John, Hoprig, Macmerry
1866 Park, Thos. B., Springfield, Haddington
1894 Reid, James, Tyneholm, Pencaitland
1863 Richardson, J., Hilton Cottage, Haddington
1898 Riddell, George, Mungoswells, Drem
1862 Riddell, Wm., Cocklaw, Oldhamstocks, East Lothian
1893 Ritchie, J. B., Samuelston, Haddington
1873 Robertson, James F., Newhouse, Drem
1894 Robertson, John, Beanston Mains, Haddington
1872 Robertson, Robt., West Barns, Dunbar
1874 Robson, John, Millknowe Cranshaws, Duns (Newton, Bellingham)
1895 Ronaldson, George, Kilduff Mains, Drem
1886 Scott, Alex., Summerfield, Dunbar
1883 Scott, G. R., Commercial Bank, Dunbar
1878 Sharp, John J., Ewingston, Gifford—*Free Life Member*
1877 Shields, James, Dolphington, Tranent
1884 Shillinglaw, Wm., Gifford, Haddington
1887 Simpson, James, Castlemains, Drem
1857 Smith, Adam, Nether Hailes, Haddington
1868 Smith, Andrew, Longniddry
1898 Smith, Archibald, Morham Mains, Haddington
1853 Smith, Chas., Whittinghame, Prestonkirk
1876 Smith, D. W. E., North Elphinstone, Tranent
1882 Smith, E. Hedley, B.L., Whittinghame, Prestonkirk—*Free Life Member*
1894 Steven, John, Begbie, Haddington
1893 Stewart, John, Nisbet, Pencaitland
1897 Stodart, John, Adinston, Macmerry
1855 Stodart, William, Wintonhill, Tranent
1862 Swinton, P. Burn, Holyn Bank, Gifford
1853 Sydserff, T. Buchan, of Ruchlaw, Prestonkirk
1855 Taylor, J. B., Seton West Mains, Prestonpans
1898 Tod, William, Stobshiel, Upper Keith
1859 Turnbull, P., Little Pinkerton, Dunbar
1877 Turnbull, Walter, Tynemont, Ormiston
1879 TWEEDDALE, The Marquis of, K.T., Yester, Haddington
1859 Tweedie, Alexander, Coats, Haddington
1881 Wallace, John, Hailes, Haddington
1888 Watt, Miss Adelaide, of Spott, Dunbar
1868 Watt, James, New Mains, Drem.
1847†WEMYSS and MARCH, The Earl of, Gosford, Longniddry
1888 Wilson, Peter, Rhodes, North Berwick
1885 Wylie, Major N. M., New Club, North Berwick
1893 Wylie, Robert, Heugh, North Berwick
1895 Wyllie, David, Longnewton, Haddington

Admitted
1877 Young, D S, Bonnington, North Berwick
1887 Young, James B, Elphinstone Tower, Tranent
1869 Yule, Edward, Balgone, North Berwick

LINLITHGOW.

1874 Allan, J, Corn Merchant, Bo'ness
1898 Allan, Robert, Polkemmet, Whitburn—*Free Life Member*
1895 Allison, David, Newton, Winchburgh
1855 Bartholomew, James, Duntarvie, Winchburgh
1883 Bartholomew, John, Duntarvie, Winchburgh
1858 Borthwick, John, V S, Kirkliston
1876 Brock, J. E, Overton, Kirkliston
1885 Brownlee, George, Cousland, Bathgate
1875 Brownlee, James, East Whitburn Farm
1865 Bryce, James, East Whitburn, Whitburn
1898 Bryson, George, The Craigs, Bathgate
1895 Cadell, Henry M, of Grange, Grange House, Bo'ness
1869 Cadzow, J, Bingoui, Uphall
1899 Dalziel, Alex, Stonyburn Fauldhouse
1881 Drysdale, And L, The Leuchold, Dalmeny Park, Edinburgh
1870 Dudgeon, Alex, Humbie, Kirkliston
1869 Dudgeon, George, Almondhill, Kirkliston
1887 Dudgeon, Jn G, Easter Dalmeny, Dalmeny
1889 Ferrier, Wm C, Birkenshaw Bathgate
1895 Fleming, H B, The Haugh, Kirkliston
1869 Glendinning, Alex, New Mains, Kirkliston
1876 Graham, William, Wheatlands, Cramond Bridge
1860 Hog, Thos A, of Newliston, Kirkliston
1887 Hope, Capt Thos, of Bridge Castle, Bathgate
1884†HOPETOUN, The Earl of, Hopetoun House, South Queensferry
1892 Hutchison, Thomas, of Carlowrie, Kirkliston
1856 Johnston, John, Bathgate
1880 Learmonth, G. Gray, North Bank, Bo'ness
1863 Lesslie, James, Boghall, Linlithgow
1889 Macaulay, Jas F, Kinneil Estate Office, Bo'ness
1869 M'Kinlay, John, Balbardie House, Bathgate
1847 M'Lagan, Peter, of Pumpherston, Mid-Calder
1883 MacNab, John, Glenmavis, Bathgate
1879 Masson, Rev. Alex, The Manse, Kirkliston
1867 Meikle, John, Grougfoot, Linlithgow
1879 Meikle, William, East Bonhard, Linlithgow
1877 Mitchell, George, Broxburn Park, Broxburn
1859 Morrison, J, West Dalmeny, Dalmeny
1897 Newlands, Alex, Implement Maker, Linlithgow
1888 Nimmo, Thos, Kirklands, Winchburgh
1899 Nisbet, Gavin, Inch, Bathgate
1873 Orr, James, Hill, Whitburn
1897 Pattison, Walter, Wallhouse Bathgate
1893 Paul, James, Walton, Linlithgow
1896 Ralston, A Agnew, Hopetoun House, South Queensferry
1868†ROSEBERY, The Earl of, K G, Dalmeny Park, Edinburgh
1889 Rough, Robert L (R Rough & Sons), Broxburn
1892 Russel, James, Dundas Castle, Queensferry
1899 Smith, George, West Mills, Mid Calder
1864 Steuart Captain R, of Westwood, West Calder
1899 Stewart, Capt Stair Johnston, Champfleurie, Linlithgow
1892 Thomson, Seton M, Preston House Linlithgow
1888 Tod, Wm, Pardovan, Philipstoun, Linlithgowshire
1895 Wilson, David Riccarton, by Linlithgow
1897 Young James, Mannerston, Linlithgow

5.—ABERDEEN DISTRICT.

EMBRACING THE

COUNTIES OF ABERDEEN, BANFF, FORFAR (EASTERN DIVISION), AND KINCARDINE.

ABERDEEN.

Admitted
1868†ABERDEEN, The Earl of, Haddo House, Methlick
1885 Abernethy, David W., Ferryhill Foundry, Aberdeen
1884 Adam, Alexander, 38 Gilcomston Park, Aberdeen
1890 Adam, Walter, Corskellie, Huntly
1876 Ainslie, Ainslie Douglas, of Delgaty Castle, Turriff
1875 Ainslie, Wm., Pitfour, Mintlaw
1894 Aitchison, Walter, Comiecleuch, Huntly
1876 Alexander, George, South Balnoon, Huntly
1894 Allan, David, Union Street, Aberdeen
1889 Allan, John, Aikenshill, Culter Cullen, Aberdeen
1894 Anderson, Geo., Nether Aucharnie, Forgue, Huntly
1885 Anderson, George, West Fingask, Old Meldrum
1876 Anderson, John M., Huntly
1881 Anderson, Robert, Wester Coull, Tarland
1894 Anderson, William, Saphock, Old Meldrum
1876 Anderson, William, Manse, Lynturk, Alford, Aberdeen
1876 Anderson, William, Wardes, Kintore
1885 Angus, Samuel, Bonnymuir, Aberdeen
1895 Annand, John F., Kildrummy Estate, Mossat—*Free Life Member*
1882 Argo, James, Cairdseat, Udny, Aberdeen
1894 Arnott, Geo., Leather Merchant, Huntly
1885 Bain, George, Parkside, Old Meldrum
1893 Ballingall, Robert Rennie, Crimmonmogate, Lonmay
1858 Barclay, C. A., Aberdour House, Fraserburgh
1862 Barclay, J. W., 60 Dee Street, Aberdeen
1885 Barclay, Morrison, 60 Dee Street, Aberdeen
1893 Baron, James, C.E., 1 Bon-Accord Street, Aberdeen
1884 Barron, Geo. F., Meikle Endovie, Alford, N.B.
1888 Baxter, Andrew, 7 Millburn Street, Aberdeen
1885 Bean, James, Mains of Dumbreck, Udny
1882 Beaton, James, Burnside House, Turriff
1885 Beaton, John, Station Hotel, Insch
1876 Beddie, James, The Mains, Ardlaw, Fraserburgh
1876 Bell, John, Tyrie Mains, Fraserburgh
1894 Bennet, Jas., Binghill, Peterculter, by Aberdeen
1888 Bennet, L., 54 Gerrard Street, Aberdeen
1894 Bennet, Wm., Little Forgue, Forgue

Admitted
1885 Black, James, Barthol Chapel, Old Meldrum
1894 Black, Wm., Kinernie, Dunecht, Aberdeen
1893 Booth, Matthew, Mastrick Stocket, Aberdeen
1884 Bothwell, Wm., Berryhill, Bridge of Don, Aberdeen
1879 Bowman, James, Square, Huntly
1895 Brand, Robert, Ardiffery, Cruden, Ellon
1895 Brown, Alexander G., Whitehill House, Fraserburgh
1892 Brown, Jas., Commercial Hotel, Turriff
1886 Brown, James H., Banker, Ellon
1884 Brown, John, Craigie Cottage, Hardgate, Aberdeen
1894 Brown, Robert, Mains of Williamson, Culsalmond
1868 Bruce, George, Heatherwick, Keith Hall
1876 Bruce, James, Collithie, Gartly
1868 Bruce, James, Inverquhomery, Mintlaw
1876 Bruce, Peter, Myreton, Insch, Aberdeen
1894 BURNETT, Sir Thomas, of Leys, Bart., Crathes Castle, Aberdeen
1875 Burr, Alexander, Tulloford, Old Meldrum
1895 Butchart, James, Advocate, Aberdeen
1876 Campbell, Silvester, Kinellar, Aberdeen
1895 Cantlay, John, Ashallow, Cruden
1894 Cardno, Andrew P., Bogenlea, Monquhitter, Turriff
1895 CARNEGIE, Lord, Crimmonmogate, Lonmay
1894 CATHCART, Sir Reginald A. E., Bart., Cluny Castle, Aberdeen
1898 Chalmers, James, Auchrynie, Strichen
1894 Chalmers, John Lovie, Wester Cardno, Fraserburgh
1864 Chalmers, Wm., Maison Croft, Elrick, Summerhill, Aberdeen
1894 Chapman, William, Woodhead, Aberdour, Fraserburgh
1894 Charles, Wm., Gammons, Rothie-Norman
1894 Chessor, James, Craigiebanks, Fraserburgh
1869 CLARK, Sir John F., of Tillypronie, Bart., Tarland
1893 Clarke, John Charles, Meddat, Parkhill, Aberdeen
1873 Clarke, William, Hopewell, Tarland
1858 Cochrane, James, Pitlurg House, Slains, Ellon
1893 Cocker, George, Hill of Petty, Fyvie
1886 Collie, Wm., Priestwells, Insch
1871 Cook, Charles, Carden House, Aberdeen
1894 Cook, Thos. Nicol, Dorsell, Alford, Aberdeen
1894 Cooper, John A., Dunnydeer, Insch

Admitted	
1876	Copland, Alex, Commercial Co, Aberdeen
1891	Copland, Robert, Milton, Ardlethen, Ellon
1840	Cordiner, W F, Mormond House, Cortes
1894	Cormack, James W, Howe O Boddam, Peterhead
1869	Couper, J C, of Craigiebuckler, Aberdeen
1894	Couper, J C Ogston, of Craigiebuckler, Aberdeen
1868	Cowie, Alex, jun, Turtory, Huntly
1892	Cowie, W R, Ythan Cottage, Ellon
1887	Crabb, Dd, New Aberdour, Fraserburgh
1894	Craighead, J W, Tarbothill, Bridge of Don
1878	Cran, George, Old Morlich, Inverkindie
1894	Cran, George, M D, Walbrook House, Banchory
1876	Cran, James, jun, Knockandoch, Whitehouse
1894	Cromar, Peter, Bogloch, Lumphanan
1876	Cruickshank, J, Ladysford, Fraserburgh
1894	Cruickshank, John, Mains of Balmaud, Fishrie, Turriff
1894	Cruickshank, Robert Claymires, Turriff
1876	Dakers, James, 24 Union Row, Aberdeen
1886	Darling, D C, Exchange Square, Aberdeen
1895	Davidson, Adam, Boghead of Denlugas, Turriff
1896	Davidson, Capt D F, 79th Cameron Highlanders, of Dess, Aberdeenshire
1894	Davidson, James, of Holmwood, Aberdeen
1894	Davidson, James, Newton, Cairnie Huntly
1894	Dawson, Geo, The Manor Farm, Memsie, Fraserburgh
1886	Dawson, W F G, North of Scotland Bank, Insch
1882	Dewar, Alexander, Bethlin, Midmar, Aberdeen
1896	Diack, James, Pittodrie Pitcaple
1858	Donald, James, Whitemyres House, Old Skene Road, Aberdeen
1892	Duff, Archibald, of Annfield, Aberdeen
1884	Duff, G A, of Hatton, Turriff
1894	Duff James Murray, 314 Great Western Road, Aberdeen
1858	Duguid M'Combie, P, of Easter Skene, Aberdeen
1894	Dunbar, A Duff, V S, 55 Belmont St, Aberdeen
1886	Duncan, Alexander, Bridge of Dee Aberdeen
1877	Duncan, John, Fortrie, King Edward
1877	Duncan, Patrick, Balchers King Edward
1894	Durno, James, Easter Town, Old Meldrum
1879	Durno, James, Jackston, Rothienorman
1894	Durno, James, Westertoun, Warthill
1885	Durno, Leslie Mains of Glack Old Meldrum
1891	Durward, Robert, Blelack, Coldstone, Dinnet
1868	Duthie William, Banker, Tarves
1894	Edmond, John of Kingswell, Advocate, 16 Bridge Street, Aberdeen
1895	Farquhar, James, Old Echt, Aberdeen
1872	Ferguson, Lieut Col George A, of Pitfour, Mintlaw
1898	Ferguson, James, jun of Kinmundy, Mintlaw (10 Wemyss Place, Edin)
1868	Ferguson, Thomas, 7 Westfield Terrace, Aberdeen
1870	Ferguson, William, of Kinmundy, Aberdeen (10 Wemyss Place, Edinburgh)
1894	Fiddes, Alex. Harvey, Meikle Haddo, Foveran
1895	Fletcher, Alex, Land Steward, The Mains, Glenbucket, N B
1865	Foggo, R G, Invercauld Office, Ballater
1872	FORBES, Right Hon Lord, Castle Forbes Keig
1862	FORBES, The Hon. J O, of Corse, Lumphanan
1895	Forbes, James, Balmoral, Ballater
1898	Forbes, J C Ogilvie, of Boyndlie, Fraserburgh
1874	Forbes, James, Tombreck, Glenbucket
1842	FORBES, General Sir John, of Inverernan, K C B, Strathdon
1885	Forbes, William, Ruthven, Dinnet
1885	Fowlie, James, Brucehill, New Deer
1872	France, C S, 7 Belmont Place, Aberdeen
1885	Fraser, George, Hill of Skillmafilly, Ellon
1892	Fraser, Wm N, of Findrack, Torphins
1874	Garden, Robert, Mains of Tolquhon, Tarves
1857	Garden, William, 365 Great Western Road, Aberdeen
1894	Garland, Thos, jun, Ardlethen, Ellon
1892	Garrioch, Peter, Broadford House, Aberdeen
1886	Geddes Alex, of Blairmore, Glass, Huntly
1876	Gibson, H J, 19 Silver Street, Aberdeen
1893	Gibson, Thomas Hayton, Oultercullen, Foveran
1876	Gordon, A M, of Newton, Insch
1894	Gordon, Charles E., of Cairness Lonmay
1894	Gordon, Donald, jun, Bovaglie, Ballater
1876	Gordon, Henry, of Manar, Inverurie
1886	Gordon, Henry G Fellowes, of Knockespock, Clatt
1868	Gordon, H. W, of Hallhead, Ellon
1889	Gordon, Robert, Gordonston Clatt, Kennethmont—*Free Life Member*
1876	Gordon, William, Auchallater, Braemar
1894	Gordon, Wm Fowlie, Broomhills, Pitsligo
1889	GRANT, Sir Arthur, of Monymusk, Bart
1876	Grant, John, Binkei, Methlick
1895	Grant, P A H, of Drumminor Rhynie
1894	Grant, William Fairhill, Gartly
1894	Gray, William, Balgove, Old Meldrum
1894	Gray, William, Keilyford Old Meldrum
1894	Gray, Wm, Mains of Shedocksley, Old Skene Road, Aberdeen
1890	Hadden, Gavin, Dalmuinzie Murtle
1894	Hadden, Martin L, Binghill, Murtle, Aberdeen
1864	Halkett, Jas, Auchentender Insch
1876	Hall, Alex H, 8 Braemar Place, Aberdeen
1897	Harper, Robert J Mellinside, Insch
1894	Harvey, Alex Hunter, Drums Newburgh, Aberdeenshire
1876	Harvey, G T, 1 Hosefield Avenue, Aberdeen
1854	Harvey, J H Pitgersie, Foveran, Ellon
1885	Hay, Alexander (Ben Reid & Co), Guild Street Aberdeen
1862	Hay, Col A S L, of Rannes C B, Kennethmont
1858	Hay, James, Little Ythsie, Tarves
1894	HENDERSON, Sir William, of Devanha, Aberdeen
1893	Hendry Peter, Hillockhead Huntly
1894	Howie, Peter, 10 E North Street, House, Aberdeen
1892	Huggan, John A, 35 Market St, Aberdeen
1876	Hunter, Capt A C, of Tillery and Auchiries, Aberdeen
1884	Hunter, Charles, Upper Mills of Drum, Crathes

Admitted
1894 Hunter, James, 178 King Street, Aberdeen
1872†HUNTLY, The Marquis of, Aboyne Castle, Aboyne
1884 Hutcheon, Alex., Nether Ordley, Auchterless, Turriff
1886 Hutcheon, Major John, Lower Cotburn, Turriff
1887 Hutcheon, John, of Upperton, Gask House, Turriff
1890 Innes, Lt.-Colonel Francis Newel, R.N., R.A., yr. of Learney, Torphins
1846 Innes, Col. Thos., of Learney, Aberdeen
1862 Innes, T. G. Rose, of Netherdale, Turriff
1859 Ironside, William, Clofrickford, Ellon
1894 Jessieman, Robt., Cairnhill, Huntly
1898 Johnston, Alex., V.S., Gordonstown, Rothienorman
1894 Johnston, Charles, Wholesale Merchant, Aberdeen
1894 Johnston, John, Prioryhill, Peterculter
1876 Johnstone, J., Drumwhindle Mains, Ellon
1876 Keith, Alexander, Chapelton, Ellon
1894 Keith, Alexander, Kinnermit, Turriff
1894 Keith, Alex., Spreader Hill, Lonmay
1885 Law, John, Lochend, Old Meldrum
1871 Lawson, Charles, Deebank, Cults
1868 Lawson, C., Ordhead, Cluny, Aberdeen
1876 Ledingham, A., Balnoon Cottage, Forgue, Huntly
1885 Ledingham, John, Fintry, Turriff
1889 Ledingham, J. K., North Plaidy, Turriff —*Free Life Member*
1894 Leggat, Jas. W., Garnieston, Turriff
1896 Leith, Capt. Alex., of Glenkindie, West Hall, Oyne, Insch
1890 Leith, A. J. Forbes, of Fyvie Castle, Fyvie
1869 Leith, Major Thomas, Petmathen, Oyne
1885 Leslie, David, Lochhills, New Machar
1898 Leslie, John, Kininvie, Mannofield, Aberdeen
1884 Leys, James, Asloun, Alford
1892 Littlejohn, Geo., Wellhouse, Alford, N.B.
1857 Lovie, Alex., Nether Boyndlie, Fraserburgh
1869 Lumsden, Henry, of Pitcaple, Pitcaple
1877 Lumsden, H. G., of Auchindoir, Aberdeen
1876 Lumsden, W. H., of Balmedie, Aberdeen
1894 Lyon, Alex., jun., 278 George Street, Aberdeen
1884 Lyon, John, Peterwell, Fyvie
1894 Macdonald, Jas., Bridgend, Mossat, Kildrummy, Aberdeen
1868 Macdonald, R., Cluny Castle, Aberdeen
1884 M'Intosh, Jas., 50 Market Buildings, Aberdeen
1880†MACKENZIE, Sir A. R., of Glenmuick, Bart., Braikhe House, Ballater
1883 Mackenzie, Wm., 28 Adelphi, Aberdeen
1894 Mackie, Wm., Lewes, Fyvie
1869 Mackinnon, L., jun., Advocate, Aberdeen
1894 M'Laggan, Jas., Bank Agent, Torphins
1887 M'Lean, Neil, of Breda, Alford, N.B.
1889 Macpherson, And., Gibston, Huntly
1883 M'Robbie, Alex., Sunnyside, Aberdeen
1891 M'Robbie, John S., Sunnyside, Aberdeen
1884 Maitland, John, Easter Balhalgardy, Inverurie
1894 Maitland, Robert Cruickshank, Balhalgardy, Inverurie
1894 Mark, William, 69 George Street, Huntly
1876 Marr, John, Cairnbrogie, Old Meldrum
1888 Marr, W. S., Upper Mill, Tarves
1894 Marshall, Bailie Alexander, Townhead, Kintore
1894 Mearns, Daniel, Quayside, Aberdeen

Admitted
1875 Mearns, Rev. Duncan G., of Dishblair, Aberdeenshire
1892 Mennie, A. M'G., Brawlandknowes, Gartly
1875 Merson, James, Craigwillie, Huntly
1893 Merson, John, Millhill, Gartly
1895 Michie, John, Forester, Balmoral, Ballater
1876 Middleton, Alex., Belmont, Aberdeen
1895 Milligan, D. M. M., 245 Union Street, Aberdeen
1894 Milne, George, Cummings Park, Woodside, Aberdeen
1894 Milne, James, Pittendrum, Pitsligo, Fraserburgh
1867 Milne, John, Inverurie—*Free Life Member*, 1873
1887 Milne, Robt., Corse of Kinnoir, Huntly
1895 Minty, Wm., Crimmonmogate Mains, Lonmay
1876 Mitchell, William, Mains of Biffie, Old Deer
1868 Mitchell, William A., Auchnagathel, Keig
1881 Moffatt, Wm., Great N. of S. Railway, Aberdeen
1886 Moir, Alexander, Rowan Bank, Woodside, Aberdeen
1885 Moir, Robert, Tarty, Ellon
1871 Morris, W., V.S., 7 Langstane Place, Aberdeen
1898 Morrison, Alex., 25 Market Street, Aberdeen
1894 Morrison, Alex. Smith, Stonebriggs, Pitsligo, Fraserburgh
1885 Morrison, Andrew, Upper Cotburn, Turriff
1876 Morrison, John, Hattonslap, Tarves, Old Meldrum
1894 Mowat, John, Craigmaud, by New Pitsligo
1894 Murdoch, John, Belnaboth, Glenbucket, Aberdeenshire
1879 Murray, James, Fauchfaulds, Turriff
1894 Murrison, A. R., 52 Green, Aberdeen
1894 Mutch, James G., Drumduan House, Banchory-Devenick
1872 Nares, A. F., Parkhill, Aberdeen
1869 Nicol, W. E., of Ballogie, Aboyne
1882 Norrie, Wm., Cairnhill, Monquhitter Turriff— *Free Life Member*
1894 Ogg, Charles, Baltimore, Glenbucket
1882 Ogston, Alexander M., of Ardoe, Aberdeen
1894 Park, Wm., Woodhead, Cairness, Lonmay, Fraserburgh
1894 Paterson, James, 15 Regent Quay, Aberdeen
1882 Paull, James, Advocate, Aberdeen
1894 Peters, David Cant, Aberdeen Lime Co., Aberdeen
1894 Philip, John, 2 Kirk Street, Old Meldrum
1894 Philip, William, Boynds, Inverurie
1895 Pirie, Arthur, Cartlehaugh, Mintlaw Station
1895 Pirie, A. C., Craibstone House, Buxburn, by Aberdeen
1859 Pittendrigh, A., Mains of Park, Lonmay
1894 Porter, Alex., Springhill, Old Skene Road, Aberdeen
1897 Profeit, George W., Ballater
1894 Pyper, Wm., Hillhead, Aberdeen
1894 Rae, Jas. G., Culterty, Newburgh, Aberdeen
1882 Rae, John, Corn Merchant, Ellon
1882 Rae, Wm., Advocate, Aberdeen
1894 Ramsay, Capt. Burnett, Rifle Brigade, Banchory Lodge, Banchory
1894 Ramsay, William, jun., Dyce

Admitted
1891 Reid, David, Crofts of Glenmuick, Ballater
1877 Reid, Dr James, Templeton, Mossat
1884 Reid, John, Balquharn, Alford, N.B.
1894 Reid, John, Carter, Peterhead
1894 Reid, John Low, Cromlybank, Ellon, Aberdeenshire
1884 Reid, W. R., 46A Union Street, Aberdeen
1885 Reid, William, 8 Haddon Street, Aberdeen
1894 Reith, Jas., Mains of Sclattie, Auchmill, Aberdeen
1876 Reith, Robert, Middlefield, Woodside, Aberdeen
1894 Riddell, Geo. Jas., Fish Street, Aberdeen
1876 Robertson, Duncan, Sheriff of Aberdeen
1885 Robson, Alex. (W. Smith & Sons), Aberdeen
1858 Ross, H , care of the Secretary, Mutual Improvement Association, Tarland
1871 Ross, Peter, Arngrove, Torphins
1893 Ross, Robt. Robertson, 889 Holburn St., Aberdeen
1871 Ross, Wm., Annesley, Torphins
1885 Runciman, James, Castleton, King Edward
1885 Runciman, John, Auchmull, King Edward
1894 Russell, Major-General F. S., C M.G., of Aden, M.P., Mintlaw
1894 Ruxton, Chas., Ythan Lodge, Newburgh, Aberdeen
1886 Saltoun, Right Hon. Lord, Philorth House, Fraserburgh
1894 Scott, Jas., Bruxie, New Maud, Aberdeenshire
1894 Scott, John, Factor and Banker, New Pitsligo
1881 Scott, Ronald, 58 Fountainhall Road, Aberdeen
1894 Scott, William, Corsiestone, Huntly
1857 Scott, W., Urquhart Road, Old Meldrum
1885 Sellar, R. H. N., Implement Maker, Huntly
1857 Sempill, Right Hon. Lord, Fintray House, Aberdeen
1895 Seton, Major Alexander D., Mounie, Old Meldrum
1894 Sharp, Jas. Smith, Burryhillock, Premnay
1894 Shearer, Eric Jas., Maybank Works, Turriff
1865 Shepherd, George, Shethin, Tarves
1896 Shepherd, William, Bellestraid, Logie Coldstone, Dinnet
1866 Sim, Alexander, 1 Market Street, Aberdeen
1894 Simpson, George, Fernhill, Aberdeen
1894 Simpson, James, Grain Merchant, Rothiemay Station
1885 Simpson, John, Implement Maker, Peterhead
1895 Sivewright, Adam, M.R C.V.S., Tarland
1856 Skinner, James, Woodside, Aberdeen
1889 Skirving, Robert, of Cobairdy, Huntly
1858 Sleigh, John, Strichen Mains, Strichen
1896 Sleigh, John P., Hillhead of Crimond, Lonmay
1895 Smith, C. G., The Mains, Haddo House, Aberdeen
1894 Smith, Duncan M., 27 Argyll Place, Aberdeen
1885 Smith, James, Burnshangie, Strichen
1885 Smith, J. S., Northern Agricultural Company, Aberdeen
1894 Smith, Robert, jun., Boggieshalloch, Turriff

Admitted
1895 Smith, William, Bogside of Adamston, Huntly
1894 Smith, W. J. Woodman, 20 King Street, Aberdeen
1858 Stephen, James, Lethenty, Inverurie
1896 Stewart, Alexander G., Ballaterach, Dinnet
1889 Stewart, Sir David, of Banchory, Banchory House, Aberdeen
1885 Still, Alexander W., Nether Anguston, Peterculter
1885 Still, Geo., Strathray, Kinnellar, Blackburn, Aberdeen
1894 Stoddart, Geo., Airyburn, Dyce
1893 Stoddart, George, Annfield, Huntly
1883 Strachan, Alexander, Wester Fowlis, Alford
1878 Strachan, Charles, Tillyorn, Tarland
1858 Strachan, Lewis, Cluny of Raemoir, Banchory
1894 Strachan, Lewis, Tulloch, Lumphanan
1894 Strachan, Patrick, Eastown, Tarland
1894 Strachan, Wm., Upper Muirden, Turriff
1865 Stuart, Alexander, of Laithers, Turriff
1885 Stuart, E. R. Burnett, of Dens and Crichie, Mintlaw
1876 Tait, John, Crichie, Inverurie
1876 Taylor, James, Toux, Mintlaw
1894 Taylor, J. W , Middle Ardo, Belhelvie
1894 Tennant, Jas., Honeynook, Monquhitter, Turriff
1875 Thomson, Wm., Banker, Tarland
1853 Turner, John, of Turner Hall (St Stephen's Avenue, Elmers, Surbiton, S.W.)
1898 Turner, John, yr. of Turner Hall, Ellon
1873 Udny, J H. F., of Udny and Dudwick, Aberdeen
1876 Urquhart, Major F. P., of Craigston, Turriff
1884 Walker, David, Coullie, Udny
1893 Walker, Roderick, Meiklefolla, Rothienorman
1858 Walker, Wm , Ardhuncart, Mossat
1894 Watson, David, Burnthill, Pitsligo, Fraserburgh
1894 Watson, Wm., Middlemuir, Aberdour, Strichen
1894 Watt, George, Coralhill, Fraserburgh
1868 Watt, Gordon, Mains of Kebbaty, Sauchen
1889 Watt, John, Newton of Mounie, Daviot, Old Meldrum
1894 Wattie, John, Milton, Glenbucket
1894 Webster, James C., Millmoss, Turriff, N.B.
1893 Webster, William, Towie Barclay, Auchterless, Aberdeen
1894 White, Jas., Legatsden, Pitcaple
1882 Whyte, John, 245 Union Street, Aberdeen
1873 Wilken, George, The Cottage, Waterside, Alford
1858 Williamson, A. F., Kingsfield House, Kintore
1850 Williamson, George, 104 King Street, Aberdeen
1894 Williamson, R. D., Bendauch, Kinaldie, Aberdeen
1895 Wilson, Alex. S., 123½ Union Street, Aberdeen
1876 Wilson, George, The Square, Insch
1894 Wilson, Geo., Badentyre, Turriff
1892 Wilson, James, jun., University, Aberdeen—*Free Life Member*
1865 Wilson, John, Castle Park, Huntly
1895 Wilson, Robt. M., M.D., Old Deer, Mintlaw Station
1885 Wilson, Wm., Coynachie, Gartly
1838 Yeats, William, of Aquharney, Beaconshill, Aberdeen

Admitted
1895 Yool, William, Glenlogie, Forbes, Aberdeen
1868 Yull, John S., Little Ardo, Methlick

BANFF.

1885 Alcock, John, Surveyor, Keith
1893 Allan, George M., of Montbletton, Banff
1897 Anderson, George, Fordyce, Portsoy
1893 Anderson, James, Minmore, Glenlivet
1893 Barclay, Geo., Strocherie, King Edward, Banff
1893 Beaton, L., The Farm, Cullen House, Cullen
1893 Bisset, James, of Paddocklaw, Kilnshade, Macduff
1899 Bruce, Charles, Bogmuchals Lodge, Portsoy
1874 Bruce, G., Tochineal, Cullen
1852 Bryson, W. G., Strathlene, Buckie
1894 Cameron, Geo., Bogbain, Keith, N.B.
1875 Campbell, James, Cullen House, Cullen
1887 Cowie, Geo., jun., Pitglassie, Dufftown
1894 Craigie, William, Pennan Farm, Banff
1883 Cran, John, Butcher, Keith
1898 Cruickshank, William, North Sandlaw, Alvah, Banff
1868 Cumming, George, Writer, Banff
1889 Cumming, J. F., Cardow, Craigellachie
1876 Dawson, William, Gordon Castle, Fochabers
1893 Dey, James, Forkins, Botriphnie, Keith
1893 Donald, George, of Ladyhill, Grange, Keith
1880 Duff, Thomas Gordon, of Drummuir, Keith
1888 Duncan, G. A., Foundry, Banff
1868 Duncan, R., Auchenbaidie Mains, Banff
1883 Duncan, Robert, Banff
1884 Fife, The Duke of, K.T., Duff House, Banff
1893 Fortune, John, Broom, Portsoy
1894 Fowler, David, Ladysbridge Asylum, Banff
1884 Gilchrist, James, Baker, Banff
1895 Gill, George, of Bloodymire, Macduff
1881 Gordon, John P., of Cairnfield, Buckie
1876 Gordon, P. G., Nevie, Glenlivet, Ballindalloch
1886 Graham, William, Brewer, Banff
1898 Grant, Geo., Glenfarclas, Ballindalloch
1876 Grant, G. S., Auchorachan, Glenlivet, Ballindalloch
1898 Green, John, Whyntie, Portsoy
1874 Green, Robert, Ruthrie, Aberlour
1898 Horn, Alex., Brangan, Portsoy
1876 Inkson, Thomas F., Kinermony, Craigellachie
1881 Innes, Sir J., of Balveny and Edingight, Bart., Keith
1874 Kelman, William, Burnside, Buckie
1883 Kemp, James, Lime Works, Keith
1896 Law, Charles E., Holl Farm, Keith
1892 Leslie, Alexander, Braco House, Grange, Banffshire
1876 Leslie, A. F., Montcoffer House, Banff
1894 Livingstone, William, Newton of Mountblairy, Banff
1894 Longmore, George, Rettie, Boyndie, Banffshire
1885 Longmore, Leith E., Rettie, Banff
1897 Lumsden, General Sir Peter, G.C.B., of Buchromb, Dufftown
1883 M'Donald, Alexander (M'Donald Bros.), Portsoy
1885 M'Donald, Alexander, Kindrought, Fordyce
1884 MacGillivray, A. E., V.S., Banff
1891 MacIntosh, William, Drummuir, Keith
1876 Macpherson, J., Mulben, Keith
1887 Maitland, Harry Reid, Muiryfold, Grange, Keith—*Free Life Member*
1858 Maitland, William, Muiryfold, Grange, Keith
1893 Marsden, Wm. James, V.S., Castle St., Banff
1880 Menzies, W. G. Steuart, Aikenway, Craigellachie
1874 Miller, John, Seafield, Cullen
1893 Moggach, Joseph, Mains of Towiebeg, Botriphnie, Keith
1893 Morison, Alex. O., Corskie, Banff
1886 Morison, Col. F. D., of Mountblairy, Turriff
1885 Morison, James O., of Culvie, Aberchirder
1885 Morrison, John, Knock, Keith
1893 Murray, Alex., Old Manse, Boyndie, Banff
1858 Murray, William, Mains of Pittendreigh, Turriff
1897 Napier, Robt., Nether Dallachy, Boyndie
1873 Ogilvie, A. M., Tillynaught, Portsoy
1873 Paterson, Wm., The Elms, Turriff
1892 Raffan, Robert, Knowiemoor, Fordyce
1869 Ramsay, Alex., *Banffshire Journal* Office, Banff
1840*Richmond and Gordon, The Duke of, K.G., Gordon Castle, Fochabers
1895 Robertson, William, Grain Merchant, Banff
1896 Ross, James, Mill of Towie, Keith
1893 Ross, William, Hilton, Buckie
1893 Seafield, Countess-Dowager of, Cullen House, Cullen
1897 Shearer, Joseph, Craigellachie
1883 Simpson Alexander, Duff House, Banff
1876 Simpson J. (Auchinachie & Simpson), Keith
1894 Simpson Thos. A., Colleonard, Banff
1891 Simpson, Wm., Douglasbrae Manure Works, Keith
1894 Skene, John, Montbletton Lodge, Banff
1874 Skinner, William M., Drumin, Ballindalloch
1894 Smith, George, Parkmore House, Dufftown
1898 Smith, George, Ordens, Banff
1852 Smith, J. Gordon, Minmore, Ballindalloch
1869 Smith, J., Mullochard, Ballindalloch
1845 Steuart, And., of Auchlunkart, Keith
1887 Stuart, A. R., of Inverfiddich, Craigellachie
1873 Stuart, C., Tomindugle, Knockando, Craigellachie
1894 Stuart, William, Chapelton, Marnoch, Banff
1894 Taylor, William L., Union Bank, Cullen
1894 Thomson, William, Tynet Mills, Port-Gordon
1876 Turner, R., Auchnarrow, Ballindalloch
1883 Turner, Robert, Cairnton of Boyndie, Portsoy
1881 Walker, George, Milton Distillery, Keith
1898 Watson, William, Banff Foundry, Banff
1885 Wilson, James, Inchgower, Buckie
1893 Wilson, James, of Myrieward, Tenrood, Botriphnie, Keith

FORFAR

(Eastern Division).

1889 Adam, John, Bolshan, Arbroath
1893 Adamson, William S., Careston Castle, Brechin
1898 Allison, Archibald, Dubton, Brechin
1884 Anderson, D., Woodhill, Carnoustie

Admitted

1868 Anderson, Jas , Westside, Brechin

1890 Arnot, David, Mains of Edzell, Brechin

1896 Arnot, William, Fithie, Brechin

1876 Bean, Alexander, Ballochy, Montrose

1876 Bean, George, West Ballochy, Montrose

1890 Bell, James, Gilchorn, Arbroath

1896 Bell, J B , Burnton, Inverkeillor

1894 Campbell, Dr Archibald, Keenie, Edzell

1849 Campbell, J A , of Stracathro, M P , Brechin

1887 Campbell, Jas Morton Peto, yr of Stracathro, Brechin

1886 Carnegie, Alex , of Redhall, Forebank House, Brechin

1869 Carnegie, H L , of Kinblethmont, Arbroath

1894 Carnegie, James, Arrat, Brechin

1887 Chalmers, P , Aldbar Castle, Brechin

1890 Collier, John W , Hatton, Carnoustie

1879 Colquhoun, Dug , Vitriol Works, Carnoustie

1893 Coupar, Andrew, jun , West Kintrockat, Brechin

1859 Coupar, John, Balrownie, Brechin

1855 Croll, John, Orchard Park, Broughty Ferry

1891 Cruikshank, A W , of Langley Park, 5 Branch Hill, Hampstead, London, N W

1858 Dickson, James A , Woodville, Arbroath

1875 Duncan, A R , Newmans Walls, Montrose

1898 Duncan, James Balfour, Brechin

1884 Fairweather, John, Chapletown, Brechin

1892 Falconer, James, Milton of Conon, Carmyllie, Arbroath

1894 Farquhar, Alexander, Careston, Brechin

1894 Ferguson, William Ironmonger, Brechin

1885 Finlayson, James, Balcathie, Arbroath

1890 Fleming, Alex , Charleton, Montrose

1891 Fleming, James, Friock Mains, Friockheim

1890 Fletcher, Fitzroy C , of Letham Grange, Arbroath

1894 Fraser, Andrew, Balmachie, Carnoustie

1890 Gardyne, James W Bruce, Middleton House, Friockheim

1895 Grant, Colin, Denfield, Arbroath

1893 Hall, George, Erdington Villa, Carnoustie

1876 Harper, F V , Dunlappie, Edzell

1894 Henderson, James, Kincraig, Brechin

1880 Hume, David, Barrelwell, Brechin

1896 Hynd, James, jun , Hodgeton, Inverkeillor, Arbroath

1894 Ireland Thomas, Brewer, Brechin

1894 Jarron, James Alexander, Arbikie, Inverkeillor, Arbroath

1896 Johnstone, James D , Orange Lane, Montrose—*Free Life Member*

1894 Johnstone, John, Balnabreck, Brechin

1890 Kydd, James, Scryne, Carnoustie

1897 Leighton, John of Balglassie, Brechin

1895 Lyall, Alexander, of Gardyne Castle, Montrose

1854 Lyall, David, of Gallery, Montrose

1881 M'Corquodale, D A , Banker, Carnoustie

1880 Macfarlane, David, West Haven, Carnoustie

1894 M'Intosh, Thomas, Knowhead, Brechin

1897 M'Kinnon, James, Barnhill, Broughty Ferry

1887 MacNab, William, Keithock, Brechin

1898 Macpherson, Colin, Braefoot Carnoustie

1890 Marshall, James Scott, Burnside, Carnoustie

1889 Miller, James, Balgillo, Broughty Ferry

1889 Miln, George, Solicitor, Arbroath

1894 Milne, Andrew C , Grange, Inverkeillor, Arbroath

Admitted

1894 Milne, George Gardyne, Montrose

1879 Mitchell, James, Merchant, Montrose

1881 Mitchell, Wm , Ledmore, Menmuir, Brechin

1868 Morgan, D , South Mains of Ethie, Arbroath

1884 Nicoll, Wm , Hilton of Fearn, Brechin

1893 Nicoll, William, jun , Mains of Gallery, Montrose

1890 Ogilvie, James Swan, Brackenbrae, Broughty Ferry

1890 Ouchterlony, Lt -Col T H , The Guynd, Arbroath

1885 Pattullo, James, Abertay, Broughty Ferry

1891 Pattullo, John, Hatton Mill, Friockheim

1884 Petrie, David D , 12 Ann Street, Arbroath

1897 Porter, Robert, Airnhall, Brechin

1891 RAMSAY, Hon Charles Maule, Brechin Castle, Brechin

1882 Risk, James, Pittendreich, Brechin

1882 Robertson, James, Panmure, Carnoustie

1884 Rodger, Geo , Waulkmills, Inverkeillor, Arbroath

1882 Rodger, Robt , jun , Mains of Dun, Montrose

1894 Rodger, John Laurie, Nether Careston, Brechin

1895 Samson, James, Balmyllo, Montrose

1895 Samson Jas jun , Balmyllo, Montrose

1866 Scott, D G C , Maisondieu, Brechin

1883 Scott Jas Addison, Newton, Arbirlot, Arbroath

1883 Shepherd, John Lundie, Brechin

1885 Shiell John Solicitor, Brechin

1895 Smith, A Rae Law of Craigo, Montrose

1884 Soutar, D , Powis Montrose

1850†SOUTHESK, The Earl of, K T , Kinnaird Castle, Brechin

1880 Stansfeld, Capt John, Dunninald, Montrose

1895 Stoven, William Craigmill, Carnoustie

1894 Swan, Wm C , Inverpeffer, Carnoustie

1890 Taylor, Robt , Pitlivie, Carlogie House, Carnoustie

1894 Watson, William, Boddin Montrose

1894 Wemyss, Dr John W Broughty Ferry

1874 Wood, Chris , Kintrockat House, Brechin

1899 Wood, Robert, Admiral Street, Carnoustie

1884 Young, George, Panlathie, Carnoustie

1895 Young, James, Fordhouse, Montrose

KINCARDINE.

1876 Adam, William, Bush, Banchory Ternan

1857 Anderson, Wm , Hattonburn, Banchory

1894 Annandale, A B , Bank Agent, Stonehaven

1881 BAIRD, Sir Alex , of Urie, Bart , Stonehaven

1894 Baird, Henry Robert, of Durris, Aberdeen

1892 Barrie, James Butcher, Stonehaven

1884 Braid, Thomas, Durris, Aberdeen

1893 Brown, Geo T , East Cairnbeg, Fordoun

1873 Brown, W , Pitnamoon, Laurencekirk

1894 Calder, Jas , Midtown of Barras, Stonehaven

1856 Calder, R , Raemoir, Banchory Ternan

1894 Carr, Wm , East Mains of Barras, Stonehaven

1871 CLINTON, Right Hon Lord, Fettercairn House, Fettercairn

1884 Cooper, John, Ley, Banchory Ternan

1893 Crichton, William, Castleton of Kincardine, Laurencekirk

1864 Davidson, J , Harestone, Banchory

Admitted
1876 Dickson, Patrick, Laurencekirk
1897 Don, Alex., jun., Bank House, Fettercairn
1894 Don, Jas., Auquhirie, Stonehaven
1896 Duff, Robert W., of Fetteresso, Stonehaven
1873 Falconer, Wm., Cairnton, Fordoun
1897 Findlay, John M., Clochanhill, Stonehaven
1894 Forrest, James, Westerton, Nigg, Aberdeen
1894 Forrest, Wm., Abbotswell, Kincorth, Nigg
1873 Fortescue, Archer, of Kingcausie, Aberdeen
1891 Gammell, Sydney James, yr. of Drumtochty, Fordoun
1876 GLADSTONE, Sir J. R., of Fasque, Bart., Fettercairn
1869 Grant, Capt. Frederick G. Forsyth, of Ecclesgreig, Montrose
1873 Greig, James Booth, Laurencekirk
1884 Greig, William, Ashentilly, Durris, Aberdeen
1864 Hart, John, Cowie House, Stonehaven
1878 Hay, J. T., of Blackhall Castle, Banchory
1896 Bird, Samuel, Sauchenshaw, Muchalls, Stonehaven
1884 Hunter, George, Kirktown of Banchory, Banchory-Ternan
1888 Innes, Rev. W. D., of Cowie, Stonehaven
1873 Kinnear, Arthur W., Stonehaven
1876 Kinross, J., Coldstream, Laurencekirk
1876 KINTORE, Right Hon. The Earl of, Inglismaldie, Laurencekirk
1876 Littlejohn, William, Easter Tulloch, Stonehaven
1894 M'Gregor, Geo., Mills of Cowie, Stonehaven
1896 M'Inroy, Col. Charles, of The Burn, C.B., Edzell
1894 Milne, Jas., Balnagubs, Netherley, Muchalls
1894 Milne, James, jun., Easter Cairnhill, Fetteresso, Muchalls
1894 Murray, A. B., Auction Mart, Stonehaven
1894 Myles, John Blythe, Pitcairy, Bervie

Admitted
1857 Nicholson, J. Badenach, of Glenbervie, Fordoun
1855 Paul, William, Stranathro Cottage, Muchalls
1863 Pearson, David A., Johnston Lodge, Laurencekirk
1894 Peat, Wm., Westerton, Laurencekirk
1885 Philip, Forbes, Tullos Home Farm, Nigg, Aberdeen
1878 Porteous, D. S., of Lauriston, Montrose
1885 Ross, Alexander, Mains of Newhall, Fetteresso, Muchalls
1899 Scott, John, Albyn Cottage, Laurencekirk
1882 Shand, T. L. R., of Fawsyde, Bervie
1894 Shaw, Charles, Maidenfold, Maryculter, Aberdeen
1898 Sim, James, The Temple, Drumlithie, Fordoun—*Free Life Member*
1863 Sinclair, D., of North Loirston, Aberdeen
1876 Skeen, Geo., Meikle Fiddes, Drumlithie
1873 Smith, James, Pittengardner, Fordoun
1873 Smith, John, Balmain, Fettercairn
1868 Smith, W., New Mains of Urie, Stonehaven
1868 Smith, W., of Benholm, Johnshaven
1892 Stephen, David K., Commieston, Montrose
1893 Stewart, George, Haulkerton Mains, Laurencekirk
1858 Taylor, Geo., of Kirktonhill, Montrose
1893 Taylor, John, Uras, Stonehaven
1857 Taylor, Robert, Drumfienny, Banchory
1891 Thom, James H., Westerton of Stracathro, Brechin
1894 Thomson, Geo., Tomacoile, Banchory
1866 Thomson, James, Balbegno, Fettercairn
1888 Thomson, W. J. Sandford, Balmanno, Laurencekirk
1888 TREFUSIS, Hon. Chas. S. Forbes, Fettercairn House, Fettercairn
1876 Valentine, Geo., Benholm, Johnshaven
1863†Walker, G. J., Mains, Portlethen, Aberdeen
1893 Walker, John Wilson, Hillside House, Portlethen, Aberdeen
1892 Walker, Robt. W., Portlethen, Aberdeen
1896 Young, John, Rothnick, Muchalls, Stonehaven

6.—DUMFRIES DISTRICT.

EMBRACING THE

COUNTIES OF DUMFRIES, KIRKCUDBRIGHT, AND WIGTOWN.

DUMFRIES.

Admitted
1895 Adamson, Robert, W.S., Irish Street, Dumfries
1879 Aitken, John M., Norwood, Lockerbie—*Free Life Member*
1892 Allan, Alex. Y., Croft Jane, Thornhill
1883 Allan, Wm., 22 High Street, Dumfries
1898 Allison, Hubert, Park End, Lockerbie
1898 Anderson, Jonathan, Eaglesfield, Ecclefechan
1895 Anderson, Walter, Hazelbank, Wamphray
1887 Austin, James J. M., of Dalmakerran, Tynron
1880 Austin, William, Bank Agent, Thornhill
1888 Baird, Alex., West Mains, Collin, Dumfries
1871 Baird, John, Solicitor, Lockerbie
1877 Baird, J. W., Courance, Lockerbie
1895 Barber, William, Tererran, Moniaive
1895 Barbour, Gavin, Hazelbrae, Lochmaben
1895 Beattie, John, Baurch, Annan
1870 Beattie, John, Bulmansknowe, Canonbie
1898 Beattie, Lewis, Mossknowe, Canonbie
1897 Beattie, Thomas, Torduff, Annan
1878 Beattie, William J. P., Hope Lodge, Moffat
1868 Bell, Alexander, Stobahill, Lockerbie
1886 Bell, Geo., Crossbankhead, Ecclefechan
1895 Bell, Robt., M.D., Glenae, Dumfries
1878 Bell, William, Todholes, Annan
1895 Blackley, John, Marchhill, Dumfries
1889 Blacklock, John, Solicitor, Dumfries
1878 Borland, John, Auchencairn, Closeburn, Thornhill
1898 Brand, David, Hangingshaw, Lockerbie
1878 Broatch, George, Thwait, Ruthwell
1895 Broatch, George, jun., Smallholm, Lockerbie
1879 Brook, Edward, Hoddam Castle, Ecclefechan
1895 Brook, E. J., yr. of Hoddam, Hoddam Castle, Ecclefechan
1895 Brown, David, Banker, Annan
1878 Brown, David, Ellerslie, Kirkmahoe
1860 Brown, James, Newington, Annan
1886 Brown, James, Burnside, Holywood, Dumfries
1895 Brown, Robert, Fairfield, Lockerbie
1884 Brown, Thomas, Guillyhill, Holywood, Dumfries
1877 Brown, T. M., Closeburn Castle, Thornhill
1895 Burnie, Arthur J., Carterton, Lockerbie
1895 Burnie, William, Penlaw, Lockerbie
1895 Burns, C., Norwood Cottage, Lockerbie
1895 Callander, Gavin, Palmerston Iron Works, Dumfries
1895 Campbell, John, Knockenjig, Sanquhar
1893 Carlyle, William Lee, Waterbeck, Ecclefechan

Admitted
1886 Carmont, James, British Linen Company Bank, Dumfries
1896 Carruthers, F. J., of Dormont, Lockerbie
1854 Carruthers, John, of Miln, Wamphray Moffat
1870 Carruthers, Jn., Scotsbrig, Ecclefechan
1876 Carruthers, Joseph, Annan Bank, Moffat
1882 Carruthers, Joseph, Solicitor, Moffat
1870 Carruthers, R. B., Huntingdon Lodge, Dumfries
1895 Carruthers, William, Balgray Farm, Lockerbie
1895 Carruthers, William R., Stenrieshill, Wamphray, Beattock
1895 Caven, James, Snade, Auldgirth
1876 Caven, Thos., Birkshaw, Glencairn, Dunscore
1876 Charlton, John, Corn Merchant, Dumfries
1878 Chrystal, Wm., Gilchristland, Thornhill
1895 Common, John, Cross Dykes, Lockerbie
1878 Connell, J. W. F., of Auchencheyne Thornhill
1878 Cormack, John F., Solicitor, Lockerbie
1886 Craig, Alex., Hunter's Lodge, Thornhill
1897 Craig, James, Bankhead, Dalswinton, Dumfries
1895 Craig, John, Bankhead, Dalswinton, Dumfries
1881 Crawford, Jas., [illegible]shend, Gretna
1892 Crawford, Peter, Dargavel, Dumfries
1895 Crawford, William, Eastfield House, Dumfries
1870 Critchley, J. A., Stapleton Tower, Annan
1899 Cross, M. M., Annan
1895 Cumming, John, 49 Buccleuch Street, Dumfries
1892 Dalgleish, John Smith, Auctioneer, Lockerbie
1895 Dalgleish, Robert, Auchentaggart, Sanquhar
1878 Dalziel, Adam, Chanlockfoot, Penpont
1869 Dalziel, James, Auctioneer, Dumfries
1878 Dalziel, Robert, Druidhall, Penpont
1895 Dickie, Joseph, South Cowshaw, Tinwald, Lochmaben
1884 Dickson, George, Braehead, Collin, Dumfries
1862 Dickson, John H., Dabton, Thornhill
1860 Dickson, T., Eccles, Thornhill
1878 Dobie, David, Banker, Lockerbie
1868 Douglas, A. H. Johnstone, Comlongan Castle, Ruthwell, R.S.O.
1882 Douglas, J., Breconside, Thornhill
1894 Douglas, James Henry, Newtonairds, Dumfries
1895 Douglas, William, Maryfield, Terregles, Dumfries
1893 Duncan, John Bryce, Newlands, Dumfries

Admitted
1895 Edgar, James, Annfield, Amisfield, Dumfries
1884 Ed[illegible]son, James H., of Riddingwood, Amisfield, Dumfries
1893 Elliot, William, Westwater, Langholm
1895 Erskine, Robert, Gladenholm, Parkgate, Dumfries
1895 Ewart, John, Cleuchbrae, Johnstone, Lockerbie
1860 Farish, Samuel, Kirkland, Lockerbie
1877 Farish, Samuel T., Kirkland, Lockerbie
1877 Farish, William R., Tinwald Parks, Dumfries
1878 Fleming, Gavin, Crowdie Knowe, Ecclefechan
1884 Fletcher, D. M., Dunnabie, Ecclefechan
1895 French, John, Glenmenna, Thornhill
1895 Fulton, Arch., Tinwald House, Torthorwald, Dumfries
1893 Galbraith, Charles E., Terregles, Dumfries
1895 Gass, Thomas, Howgillside, Kirkpatrick-Fleming, Ecclefechan
1895 Gibson, Richard, Bogge, Penpont
1882 Gillespie, Denholm, 6 MarchbankTerrace, Dumfries
1873†Gillespie, Rev. John, LL.D., Mouswald Manse, Ruthwell, R.S.O.
1884 Gillespie, William, Alton, Moffat
1895 Glover, Joseph J., Hazelwood, Maxwelltown, Dumfries
1860 Gordon, Henry, Moatbrae, Dumfries
1895 Gordon, H. S., Solicitor, Dumfries
1895 Gourlay, Francis N. M., Twomerkland, Moniaive
1893 Graham, Christopher, Skipmyre, Lochmaben
1884 Graham, Major-General John Gordon, of Wyseby, Ecclefechan
1895 Graham, William, Harlawhill, Canonbie
1895 Graham, William, Hallhills, Lockerbie
1859 Gray, Alex., Tanlawhill, Langholm
1880 GRIERSON, Sir A. D., of Lagg, Bart., Dumfries
1895 Grierson, John, Town Clerk, Dumfries
1872 Grieve, Archd., Albierigg, Canonbie
1896 Grossart, Robert F., M.R.C.V.S., Corriehill, Lockerbie
1895 Haddow, Thos. R., Merkland, Penpont
1891 Halliday, James, Sliencairn, Annan
1895 Hamilton, James, yr, Cample Bridge, Thornhill
1880 Harkness, W. I., Mitchellslacks, Thornhill
1895 Hatterslay, Neil S., Dalswinton, Dumfries
1897 Henderson, George H., Kelloside, Sanquhar
1895 Henderson, Jas., Ryemuir, Lochmaben
1895 Henderson, Jas. K., Buttknowe, Kirkconnel, Sanquhar
1887 Henderson, John, Solicitor, Dumfries
1862 Hewetson, J., Auchenbainzie, Thornhill
1870 Hiddleston, John, Kirkland, Closeburn, Thornhill
1862 Hobkirk, Jas., of Netherwood, Dumfries
1895 Holmes, Robert K., Broomrigg, Holywood, Dumfries
1895 Hotson, Ninian Wilson, Hopsrig, Langholm
1884 Howat, John, Lower Netherwood, Dumfries
1895 Hunter, David, Shearington, Caerlaverock, Dumfries
1895 Hunter, James, Hardlawbank, Holywood, Dumfriesshire
1884 Hunter, James, Lochside, Lockerbie
1895 Hunter, Thomas, Birkbush, Dumfries
1886 Hutchison, John, Lovers' Walk, Dumfries

Admitted
1895 Hyslop, Thomas L., Tower, Sanquhar
1880 Hyslop, Wm., Clenries, Sanquhar
1870 Irvine, B., Citra Villa, Lovers' Walk, Dumfries
1895 Irvine, Wm., Job and Postmaster, Dumfries
1895 Irving, David A., Cowburn, Lockerbie
1883 Irving, D. J. Bell, Knockhill, Ecclefechan
1885 Irving, H. C., of Burnfoot, Ecclefechan
1869 Irving, J. Bell, of Whitehill, Lockerbie
1895 Irving, John Bell, Mount Annan, Annan
1872 Irving, Samuel, Carco, Kirkconnel
1895 Irving, Thomas, Grange, Lockerbie
1895 Irving, Thomas, Pearsbyhall, Lockerbie
1895 Irving, Wm., Whitestonehill, Lockerbie
1895 Irving, W. O. Bell, Millbank, Lockerbie
1895 Jackson, James W., Lochhouse, Beattock
1895 Jackson, Thomas, Beattock Farm, Beattock
1895 Jardine, David Jardine, Jardine Hall, Lockerbie
1895 Jardine, Robert, Corsua, Lockerbie
1863†JARDINE, Sir Robert, of Castlemilk, Bart., Lockerbie
1893 Jardine, Robert William Buchanan, yr. of Castlemilk, Lockerbie
1896 JARDINE, Sir William, of Applegarth, Bart., Amisfield Tower, Dumfries
1890 Jeffrey, John J., Blackaddie, Sanquhar —*Free Life Member*
1895 Johnston, Archibald F. Campbell, Carnsalloch, Dumfries
1877 Johnston, James, Helenbank, Noblehill, Dumfries
1895 Johnston, John, Kirkhill, Wamphray, Beattock
1895 Johnston, Rev. John A., Dryfesdale Manse, Lockerbie
1859 Johnston, Thomas, Moffat
1878 Johnston, Wm., of Cowhill, Dumfries
1886 Johnstone, Andrew J. S., of Halleaths, Broadholm, Lockerbie
1873 Johnstone, James, Hunterheck, Moffat
1859 Johnstone, John A., Archbank, Moffat
1870 Johnstone, J. J. Hope, of Annandale, Raehills, Lockerbie
1881 Johnstone, Michael, Archbank, Moffat
1895 Joynson, Francis, Murraythwaite, Ecclefechan
1863 Kennedy, David, Castlehill, Dumfries
1864 Kerr, Abram, Old Graitney, Gretna
1878 Kerr, Archd., Upper Dormont, Lockerbie
1875 Kerr, Jn., Breconrae, Ruthwell, R.S.O.
1893 Keswick, J. J. J., Dormont, Lockerbie
1897 Keswick, Jas. J., Halleaths, Lochmaben
1875 Kirkpatrick, David, Townfoot, Amisfield, Dumfries
1893 Kirkpatrick, James, Townfoot, Amisfield, Tinwald, Dumfries
1870 Kirkpatrick, James, Auctioneer, Annan
1895 Kirkpatrick, Thomas, Byneholm, Penpont, Dumfriesshire
1895 Lawrie, C. E., Maxwellton House, Moniaive
1895 Lawrie, James, Auction Mart, Dumfries
1884 Lawrie, John P., Shieldhill, Lochmaben
1878 Lennox, David, Merchant, Dumfries
1895 Lennox, James, Merchant, Dumfries
1865 Leny, W. Macalpine, of Dalswinton, Dumfries
1873 Lindsay, James, Whitecastles, Lockerbie
1895 Lindsay, Jas., V.S., Whitesands, Dumfries
1895 Lindsay, Wm., West Roucan, Dumfries
1878 Little, James Church, Burnfoot, Langholm
1888 Little, Murray, Solicitor, Annan
1895 Little, William, Rivox, Moffat

Admitted
1895 Lorimer, William, Raecleugh, Moffat
1895 Lyon, J. Stewart, of Kirkmichael, Dumfries
1887 M'Call, Alexander, Rock Hall Mains, Collin, Dumfries
1870 M'Call, James, of Caitloch, Moniaive
1895 M'Call, William N., Caitloch, Glencairn, Moniaive
1878 M'Clure, Wm, Banker, Lockerbie
1868 M'Connell, Frederic, Blackyett, Ecclefechan
1882 MacCowan, A., of Newtonairds, Holywood
1888 M'Creath, John, Comlongan Mains, Ruthwell, R S.O.
1893 M'Crone, Wm., Castlemilktown, Lockerbie
1887 Macdonald, Alexander, Grain Merchant, Lockerbie
1895 Macdonald, J C R, W S, Dumfries
1898 Macdonald, Major William Bell, of Rammerscales, Lockerbie
1878 Macfarlan, George, Closeburn Mains, Thornhill
1885 M'Gibbon, James R., Union Bank, Moffat
1860 M'Gill, James, Banker, Dumfries
1886 M'Intosh, A J, V S, Dumfries
1895 M'Intosh, John S, Drummuir, Ruthwell, R S O
1887 M'Jannet, F J, Gateslack, Thornhill
1888 M'Jerrow, David, Solicitor, Lockerbie
1894 M'Jerrow, Jas Ewart, Fairfield, Lockerbie
1878 Mackay, D, Greenfield, Kirkpatrick, Ecclefechan
1886 Mackenzie, John A, Solicitor, Lockerbie
1895 Mackie, Andrew, Aitchisons Bank, Gretna
1895 Mackie, George, Dornock Mains, Annan
1895 Mackie, William, Wamphray Gate, Beattock
1895 M'Leod, William, Bank Street, Dumfries
1895 M'Millan, John J, Glencrosh, Moniaive
1895 M'Millan, Robert, Woodlea, Moniaive
1895 M'Millan, Thomas, Glencrosh, Moniaive
1895 M'Murray, Alex, Catherinefield, Dumfries
1886 M'Nae, Robert, V S, Dumfries
1895 Macrae, D M, Stenhouse, Thornhill
1840 Malcolm, W E, of Burnfoot, Langholm
1880 Martin, William, Dardarroch, Dumfries —*Free Life Member*
1896 Maxwell, Alexander, of Barncleugh, Dumfries
1889 Maxwell, Charles H, Dalruskin, Dumfries
1873 Maxwell, George, of Broomholm, Langholm
1882 Maxwell, Joseph, Seedsman, Thornhill
1895 Maxwell, M'Kill, Coshogle, Thornhill
1895 Maxwell, William, Chemical Manufacturer, Bellone, Dumfries
1896 Millar, William J, Engineer, Annan
1886 Millar, Wm, Lakehead, Closeburn, Thornhill
1895 Milligan, George F., Burnmouth, Thornhill
1878 Milligan, James, Hayfield, Thornhill
1870 Milligan, John, Auldgirth, Dumfries
1895 Milligan, John, Crairie Park, Durisdeer, Dumfries
1886 Milne, Thomas, Grain Merchant, Lockerbie
1870 Minto, John D., Elmbank, Dumfries
1895 Moffat, Francis, Craigbeck, Moffat
1893 Moffat, James, Gateside, Sanquhar
1862 Moffat, Thomas, Sunnyhill, Dumfries
1883 Moffat, Wm., Garwald, Langholm

Admitted
1895 Moffat, Wm. Kennedy, of Shillingland, Sunnyhill, Auldgirth, Dumfries
1878 Monilaws, Rev James J, Middlebie Manse, Ecclefechan
1878 Murray, Allan, Castlemilk Mill, Lockerbie
1895 Murray, John, Cleughside, Lockerbie
1895 Murray, William, British Linen Co Bank, Sanquhar
1886 Newbigging, Thos. Kennedy, Nurseryman, Dumfries
1895 Osborne, James, Dinning, Closeburn, Dumfries
1890 Osborne, Robert, Wynholm, Lockerbie
1898 Park, Robert, Dinwoodie Lodge, Lockerbie
1895 Paterson, John, Fingland, Wamphray, Moffat
1885 Paterson, John S., Craigdarroch, Sanquhar
1854 Paterson, J W J, Terrona, Langholm
1884 Paterson, Robert, of Robgill Tower, Ecclefechan
1899 Paterson, Robert, Longbedholm, Moffat
1885 Paterson, Wm, E. Craigdarroch, Sanquhar
1886 Paterson, Wm, Broomlands, Dumfries
1884 Pearson, A G, of Luce, Annan
1893 Pender, James, Morton Mains, Thornhill
1884 Primrose, John, Solicitor, Dumfries
1895 Primrose, Robert, Kirkbog, Thornhill
1869 QUEENSBERRY, The Marquis of, Glen Stuart, Annan
1884 Rain, Rev Thos, Hutton Manse, Lockerbie
1874 Ranken, John S., Lowesknowe, Moffat
1865 Rankin, John S, Waulkmill, Thornhill
1886 Rannie, D W, of Conheath, Dumfries
1895 Reid, James S, Barr, Sanquhar
1895 Reid, Walter, Corsebank, Sanquhar
1895 Richardson, D B, Haregills, Ecclefechan
1895 Richardson, James, Cotland, Tinwald, Dumfries
1884 Richardson, John, Braehead, Heck, Lockerbie
1878 Richardson, William, Milnfield, Annan
1884 Richardson, Wm, Cotland, Dumfries
1895 Richardson, Wm, Milton, Beattock, N B.
1895 Robinson, R, Steam Mills, Annan
1893 Robson, John, County Buildings, Dumfries
1884 Roddick, Frank, Trailtrow, Ecclefechan
1895 Rogerson, Robert, Seedsman, Dumfries
1895 Rogerson, Samuel, Boreland, Lockerbie
1895 Rutherford, Dr James, Crichton Royal Institution, Dumfries
1895 Rutherford, John, M P, Summerhill, Annan
1884 Sandilands, Robt, Corsebank, Sanquhar
1893 Scott, Chas C, Breconside, Moffat
1878 Scott, Robert A, Fairfield, Dumfries
1893 Scott, William Black, Ashley Bank, Langholm
1877 Semple, Wm, Mouswald Banks, Ruthwell, R S O
1878 Sloan, James, Coachbuilder, Dumfries
1895 Sloan, William, Shawsmuir, Closeburn, Thornhill
1895 Smith, Geo, Hope Cottage, Ruthwell
1895 Smith, Matthew, Townhead, Thornhill
1877 Smith, Robert, 5 Albany Place, Dumfries
1870 Smith, Thomas, Twiglees, Lockerbie
1895 Steel, Arthur Jackson, of Kirkwood, Lockerbie
1895 Steel, James, Pennyland, Dalswinton, Dumfries
1859 Steuart, Patrick, Middlegill, Moffat
1860 Stewart, Peter, Dornock Mains, Annan
1886 Stobo, James, Halliday Hill, Auldgirth

Admitted

1878 Struthers, Wm., Logan Mains, Canonbie

1886 Symons, John, Solicitor, Dumfries

1896 Taylor, John, Gateside, Wamphray, Beattock

1878 Thompson, Alexander, Ironmonger, Dumfries

1878 Thomson, William, M'Cheynston, Auldgirth

1878 Todd, Alexander, Wyseby Mains, Ecclefechan

1890 Underwood, Wm., Ironmonger, Annan

1893 Veitch, W. H., Park House, Ecclefechan

1894 Vivers, William, Dornocktown, Annan

1895 Walker, Captain Laurie, Crawfordton, Thornhill

1886 Wallace, James R. W., Auchenbrack, Thornhill

1889 Wallace, John William, Wallace Hall, Auldgirth

1885 Wallace, William, of Whitewoollen, Lockerbie

1875 Waugh, John, Keenwood Hall, Moffat

1886 Whitelaw, James W., Solicitor, Dumfries

1895 Wightman, Jas., South Mains, Sanquhar

1869 Wightman, John Seton, of Courance, Lockerbie

1896 Will, George, Crichton Royal Institution, Dumfries

1895 Williamson, Ninian Alex., of Carzield, Kirkmahoe, Dumfries

1895 Williamson, Robert, Tinwald Downs, Auldgirth

1895 Wilson, Alex., Stakeford, Dumfries

1898 Wilson, Francis H., Brydekirk Mills, Annan

1895 Wilson, James, 146 High St., Dumfries

1870 Wilson, James R., Banker, Sanquhar

1878 Wilson, John, Tinwaldshaws, Tinwald, Dumfries

1895 Wilson, John, Boghead, Dumfries

1878 Wilson, P. M'C., Nether Gribton, Dumfries

1877 Wright, Thos., Howgillside, Ecclefechan

1895 Wyllie, James, Grain Merchant, 3 Loreburn Park, Dumfries

1864 Yorstoun, M. C., of Tinwald, Irvine House, Canonbie

1895 Young, Homer, Redhills, Dumfries

1896 Young, H. S. M., Carronhill, Thornhill

1891 Young, John, Moffat

KIRKCUDBRIGHT.

1889 Adamson, John, of Craigadam, Dalbeattie

1895 Allan, Robert, Howwell, Kirkcudbright

1870 Anderson, Robert, Alleyford, Kirkgunzeon

1889 Barbour, Wm., Troquhain, New Galloway

1895 Barclay, Wm. M'C., Mark, Twynholm, N B.

1884 Barrowman, John H., Caigton, Castle-Douglas

1871 Bell, William, of Gribdae, Kirkcudbright

1878 Berwick, John, Burn, Thornhill

1878 Biggar, James, Grange Farm, Dalbeattie

1858 Biggar, Thos., of Chapelton, Dalbeattie

1886 Biggar, Wm., Chapelton, Dalbeattie

1886 Blackett, Lieut.-Col. C. E., of Arbigland, Dumfries

1895 Blair, James Edward, Drumpark Mains, Dumfries

1870 Brown, Joseph, Hermitage, Dalbeattie

1861 Brown, Oliphant, Dalry, Galloway

1895 Brown, Robert, Hermitage, Urr, Dalbeattie

1895 Brown, William, Balannan, Ringford, N.B.

Admitted

1892 Caird, James A., of Cassencary, Creetown

1895 Callander, Alex., Palmerston Saw Mills, Maxwelltown, Dumfries

1895 Callander, Samuel, Clunie, Terregles, Dumfries

1885 Campbell, Robert J., Cuil, Castle-Douglas—*Free Life Member*

1888 Campbell, Thomas, V.S., Kirkcudbright

1879 Cannon, James, Urioch, Castle-Douglas —*Free Life Member*

1877 Cannon, John, Rosebank, Dalbeattie

1896 Carson, Andrew, Newfield, Dalry, Galloway

1874 Chalmers, Archd., of Kipp, Dalbeattie

1895 Clark, William, Culmain, Crocketford, Dumfries

1890 Cliff-M'Culloch, Edward A., Kirkclaugh, Gatehouse

1896 Copland, Thomas, Seeside, Terregles, Dumfries

1860 Corrie, Adam, South Park, Kirkcudbright

1860 Craig, Joseph, of Threecrofts, Lochrutton, Dumfries

1878 Craik, Geo., Argrennan Mains, Tongland

1894 Crawford, Hugh W. B., Hall of Auchencairn, Castle-Douglas

1866 Cuninghame, R. D. B., of Hensol, Castle-Douglas

1864 Cunningham, Jas., Tarbreoch, Dalbeattie

1889 Cunningham, John, Durhamhill, Dalbeattie

1879 Currie, John, Kirkeoch, Kirkcudbright

1895 Douglas, John, Barstibly, Castle-Douglas

1895 Douglas, Thomas, Lochdougan, Castle-Douglas

1878 Douglas, Wm. D. R., of Orchardton, Castle-Douglas

1877 Dudgeon, R. F., of Cargen, The Grange, Kirkcudbright

1889 Duncan, James, East Glenarm, Crocketford, Dumfries

1884 Dunlop, Captain H. L. Murray, of Corsock, Dalbeattie

1871 Dunlop, Robert, Dryburgh, Castle-Douglas

1895 Ferguson, J., Crochmore, Dumfries

1889 Fergusson, Robert W., of Kilquhanity, Dalbeattie

1895 Fraser, Hugh, Glaisters, Corsock, Dalbeattie

1859 Frazer, John, Maxwellfield, New Abbey, Dumfries

1860 Gibson, J. T., Tullowquhairn, Kirkbean

1895 Gifford, John, Ingleston, Twynholm, R.S.O., N.B.

1888 Gillespie, William, Solicitor, Castle-Douglas

1886 Gilmour, W. P., Balmangan, Kirkcudbright

1886 Gordon, Alexander J., Kirkcudbright

1885 Gordon, Edward, Keltonhill, Castle-Douglas

1877 Gordon, James, Castle-Douglas

1879 Gordon, Sir William, of Earlston, Bart., Kirkcudbright

1895 Graham, Robert, Kirkconnel, Ringford, N.B.

1878 Gray, Adam, Ingleston of Borgue, Kirkcudbright

1859 Grierson, Wm., 41 Queen Street, Castle-Douglas

1896 Halliday, William, Halketleaths, Castle-Douglas

1876 Hayman, John, Queenshill, Ringford

1878†Herries, Right Hon. Lord, Kinharvey New Abbey, Dumfries

1853 Herries, A. Y., of Spottes (16 Heriot Row, Edinburgh), Dalbeattie

Admitted
1895 Herries, William D Y, yr of Spottes, Dalbeattie
1895 Hewitt, Hon William James, Rosebank, Gatehouse N B
1878 Hood, David A., Balgreddan, Kirkcudbright
1884 Hood, Wm , Chapelton, Borgue
1886 Hope, John, Captain R N , St Mary's Isle, Kirkcudbright
1878 Houston, John, The Hill, Castle Douglas
1886 Hughan, Major Henry H , of Airds, Parton, N B
1869 Hume, A , Auchendolly, Dalbeattie
1880 Hutchison, Graham, of Balmaghie, Castle Douglas
1879 Hutchison, J W , of Edinghame, Castle Douglas
1870 Hyslop, Andrew, Auchenreoch, Dal
1895 Hyslop, Peter, Stapleton, Annan
1886 Jamieson, John, Jameston House, Carsphairn
1871 Kay, D J , of Drumpark, Dumfries
1878 Kennedy, J M , of Knocknalling, Dalry Galloway
1890 Kerr, Jas , Mid Kelton, Castle Douglas —*Free Life Member*
1860 Kerr, Thos , Kirkchrist, Kirkcudbright
1892 Kirkpatrick, Andrew, Auchengibbert, Crocketford
1891 Kirwan, Major Wm F Maitland of Gelston, Castle Douglas
1878 Kirwan, L M , Collin Auchencairn
1895 Lorraine, Dr Walter, Castle Douglas
1895 Lusk, Matthew C , Airieland, Castle Douglas
1870 M'Call, George, Cassalands House, Maxwelltown, Dumfries
1878 M'Conchie, John, Carsewilloch, Creetown
1878 M'Cormick, John, Lochenkit, Corsock, Dalbeattie
1895 M'Cutcheon, Alex , Murrayton, Gatehouse, N B
1895 M'Dowall, John, of Girdstingwood, Kirkcudbright
1876 MacKerrow, M S , Boreland of Southwick, Dumfries
1878 M'Kie, John, of Bargaly, Castle Douglas
1882 Mackie John Gladstone, of Auchencairn, Castle Douglas
1878 M'Kinnel, William, Butterhole, Dalbeattie
1876 M'Larin, Dugald, Dalbeattie
1895 M'Naught, Robt A , Dalry Galloway
1897 M'Queen James, of Crofts, Dalbeattie
1876 M'Taggart, John, Culnaightry, Castle Douglas
1899 M'Turk, John, Bellrigg, Castle Douglas
1878 M'Turk, W A , Barlae, Dalry, Galloway
1888 M'William, John, Carantyne Villa, Dalbeattie
1877 Maitland, David, of Dundrennan, Kirkcudbright
1885 Marshall, Wm , Loch Fergus, Kirkcudbright
1878 Maxwell, James Screel, Castle Douglas
1867 Maxwell, Maxwell Hyslop, of The Grove, Dumfries
1878 Maxwell, W J , Terregles Banks, Dumfries
1879 Maxwell, Wellwood, of Kirkennan, Dalbeattie
1889†Maxwell, Wellwood H , of Munches, Dalbeattie
886 MAXWELL, Sir W F , of Cardoness, Bart , Gatehouse
878 Maxwell, W J , yr of Munches, Terraughtie, Dumfries

Admitted
1895 Miller, William, Powillimount, Kirkbean, Dumfries
1878 Mitchell, Andrew, Barcheskie, Kirkcudbright
1878 Montgomery, And , of Netherhall, Castle-Douglas
1879 Montgomery, John, Comstonend, Twynholm
1878 Montgomery, William, Banks, Kirkcudbright
1893 Morton, David, Cally, Gatehouse
1878 Muir, James, Castle Street, Kirkcudbright
1877 Muir, Wm , Craigville, Kirkcudbright
1879 Murray, B R of Parton, Castle Douglas
1879 Murray, G R , yr of Parton, Castle Douglas
1895 Neilson, John, of Mollance, Castle Douglas
1890 Nicholson, William, Bombie, Kirkcudbright
1873 Nivison, Stewart, Lairdlaugh, Dalbeattie
1878 Ovens, Walter, Torr House, Castle Douglas
1870 Paterson, D J , Watch Hall, Annan
1895 Paton, Robert, Auchenlarie Gatehouse
1895 Phillips James, Carse, Kirkcudbright
1889 Picken David L , Milton, Kirkcudbright
1892 Pilkington, L , Cavens, Dumfries
1896 Pott Captain A D R , of Todrig, Newton Dumfries
1883 Rae William, Halldykes, Rotchell Park, Dumfries
1895 Scott Robert T , Drumhumphry, Corsock, Dalbeattie
1883 Shennan, John K , Balig, Kirkcudbright
1883 Shennan, R , Balig Kirkcudbright
1895 Sibbald, William R , Torkatrine, Dalbeattie
1857 Skirving Adam, of Croys, Dalbeattie
1882 Smith, Jas , Standingstone, Twynholm, Castle Douglas
1877 Spalding, A F M , of Holm, New Galloway
1895 Sproat, Geo G B , High Creoch, Gatehouse, N B
1897 Sproat, Hugh, Lennox Plunton Borgue Kirkcudbright—*Free Life Member*
1870 Sproat, R , Lennox Plunton, Kirkcudbright
1878 Sproat W T , Borgue House, Kirkcudbright
1895 Starke, James Gibson Hamilton, Advocate of Troqueer Holm Dumfries
1857 Stewart H G Murray, of Broughton, Gatehouse
1886 Stewart Robert, of Culgruff, Crossmichael
1878 Stewart Captain William, of Shambellie, Dumfries
1868 Symington G C , Kirkcarswell, Kirkcudbright
1889 Taylor James, Meikle Ernambrie, Castle Douglas
1884 Templeton, Matthew, Dromore Kirkcudbright
1869 Thomson, John, Ardwell, Dumfries
1878 Thomson, Robert of Brae, Dumfries
1886 Timms, H A , of Slogarie New Galloway
1878 Veitch, Andrew, Girthon Kirk, Gatehouse
1895 Veitch, David Y , Low Creoch, Gatehouse N B
1879 Wallace, J , Foundry, Castle Douglas
1886 Wallace, M G , Terreglestown, Dumfries
1879 Wallace, R , Foundry, Castle Douglas
1870 Wallace, R , Langbarns, Kirkcudbright
1895 Wallet, William, Auction Mart, Castle Douglas

Admitted
1894 Wilkinson, John, Borend, Balmaghie, Castle-Douglas
1879 Williamson, A, Meikle Spyland, Kirkcudbright
1890 Williamson, Captain Cecil H, Carlingwork, Castle Douglas
1871 Williamson, Thos, Mansfield, Kirkcudbright

WIGTOWN.

1893 Adair, John, Springbank, Stranraer
1898 AGNEW, Sir Andrew Noel, of Lochnaw, Bart, Stranraer
1875 Agnew, William, Balwherrie, Stranraer
1893 Aitken Alex, Solicitor, Church Street, Stranraer
1878 Anderson, Charles, Barsalloch, Port William
1893 Anderson, John, Anabaglish, Kirkcowan
1898 Anderson, John, Drummoral, Isle of Whithorn
1878 Anderson, Robert, Balgreggan, Stranraer
1894 Armitage, Arthur Calrow, of Kirroughtree, Newton Stewart
1893 Baird, William Kirvennie, Wigtown
1878 Barbour, Robert, Balgowan, Ardwell, Stranraer
1893 Bennoch, James, Sheuchan, Castle Kennedy
1898 Bennoch, John, Solicitor, Stranraer
1896 Black, John, British Linen Bank Co, Wigtown
1878 Black, Thomas, Craigencrosh, Stranraer
1895 Brown, Hugh, Craigland Mains, Kirkcowan
1893 Brown John, Bridgehouse, Sorbie
1895 Caldwell Hugh, Culhorn Parks, Stranraer
1895 Campbell, Henry A, Penninghame House, Newton Stewart
1897 Chalmers, John Gillespie, Glenluce
1893 Christison, James Barglass, Kirkinner
1893 Clanachan, Robert, Little Genoch, Dunragit
1893 Cochran, George, North Cairn, Kirkcolm
1877 Cochran, Robert Caldons, Stoneykirk
1893 Cochran, Robert, Portencallie, Kirkcolm
1885 Cochran, William Auchentibbert, Sandhead, Stranraer
1898 Cochrane, James, Barscarrow, Sandhead
1869 Cowan, George, Mains of Park, Glenluce
1898 Craig, Robert Joseph, Innerwell, Garlieston
1895 Crawford, Archibald, Broughton Mains, Sorbie
1895 Crawford, John, Kilbreen, Stranraer
1895 Douglas, John, Balker, Castle Kennedy
1870 Drew, James, of Craigencallie, Doonhill, Newton Stewart
1898 Drew, James Lawson, Dranandow, Newton Stewart
1893 Fergusson, James, Back of Wall, Glenluce
1893 Findlay, Francis, Farmer, Appleby, Glasserton
1893 Findlay, Francis, Bailliewhirr, Whithorn
1878 Forsyth, John, Reiffer Park, Sorbie
1896 Fraser, Miss Margaret N, Isle Farm, Whithorn *—Free Life Member*
1857 Frederick, D, of Gass, Stranraer
1869 Frederick, Robert, Drumflower, Dunragit
1895 French, John M., Larg, Newton-Stewart

Admitted
1800†GALLOWAY, Right Hon The Earl of, Galloway House, Garlieston
1898 Gibson, William, Beoch, Stranraer
1871 Gourlay, R C, Arbrack, Whithorn
1898 Gray, John, Dairy Works, Stranraer
1880 Greig, T C, Rephad, Stranraer
1878 Hardie, J, jun, Mull of Galloway, Stranraer
1898 Haswell, Robert, Challochmurr, Glenluce
1848 HAY, Sir J C D, of Park Place, Bart., Glenluce
1895 Hewetson, John, Baltersan, Newton-Stewart
1895 Hewetson, Robert, Baltersan, Newton-Stewart
1877 Hughan, Peter H, Cults, Whithorn
1885 Hunter, James, Culgroat, Stranraer
1895 Hunter, Stephen, jun, Whiteleys, Stranraer
1888 Hunter, Wm, Garthland Mains, Stranraer
1895 Hutchison, John, Low Drummore, Kirkmaiden
1893 Kerr, George, Solicitor Newton-Stewart
1898 Kerr, Hugh, West Galdenoch, Stoneykirk
1893 Kerr, Thomas, Banker, Newton Stewart
1895 Kirkpatrick, Joseph, Buchan Newton-Stewart
1867 Lang, Alex, Boreland Glenluce
1895 Lennox Thomas, New Milns, Wigtown
1878 Lockhart, James, Mains of Airies, Stranraer
1878 Logan, David, Fernbank, Stranraer
1877 Lusk, Peter, Craigcaffie, Stranraer
1895 M'Caig, James M, Barnultoch, Lochans, Stranraer
1888 M'Caig, John, Challoch, Leswalt, Stranraer
1887 M'Caig, John, High Mye Stoneykirk
1893 M'Caig, R Stewart, Kilhilt Stranraer
1892 M'Clean, James Auchneal, Stranraer
1892 M'Clelland Andrew Glenturk, Wigtown
1878 M'Clew, David A, Chapel Rossan, Stranraer
1897 M'Conchie, William, Mains of Penninghame, Newton Stewart
1893 M'Connel James Boreland, Whauphill
1857 M'Connell, J A, Chapelheron Whithorn
1878 M'Connell Thomas M, V S, Wigtown
1882 M'Connell Wm, Glassnick, Kirkcowan
1884 M'Cracken, Robt, Creamery, Dunragit
1893 M'Creath Thomas, Skaith, Newton Stewart
1870 M'Culloch, John, Dinvin, Stranraer
1876 M'Culloch, Peter Whitefield Glenluce
1895 M'Culloch, William A, Cardrain, Kirkmaiden
1870 M'Dowall, Andrew, Auchtralure, Stranraer
1878 M'Dowall, R, Auchengallie, Port William
1895 M'Dowall, W R O D Young, Craig Lodge, Glenluce
1895 M'Garva, William, The Cottage, Ardwell, Stranraer
1893 M'Geoch, Thomas, Barncaughlaw, Newton Stewart
1893 M'Gill, Andrew, Barsalloch, Wigtown
1898 M'Gill, Andrew Kildonan, Stoneykirk
1895 M'Gill, John, Grange of Cree, Newton-Stewart
1870 M'Haffie, Wm J, of Torhousemuir, Wigtown
1871 M'Illraith, Thomas, Barwhanny, Kirkinner
1878 M'Ilwrick, Alex, Quarter, New Luce
1880 M'Keand, P, Airlies, Whauphill

Admitted
1898 Mackenne, Fergus, Laight, Cairnryan, Stranraer
1899 M'Lauchlin, Alex , Trade Street Steam Joinery Works, Stranraer
1893 M'Lean, Charles Arbuthnot, Solicitor, Wigtown
1857 Maclelland, Thos , North Balfern, Kirkinner
1874 M'Master, Allan, Dinvin, Portpatrick
1871 M'Master, Hugh, Blairbuy, Port William
1878 M'Master, James, Currochtree, Stranraer
1875 M'Master, John, Culhorn Mains, Stranraer
1875 M'Master, William, Challoch, Dunragit
1889 M'Master, Wm , junior, Cruggleton, Garlieston
1895 M'Millan, James, Palgown, Newton Stewart
1893 M'Naught, Alex , Hawthorn, Changue, Port William
1896 Marahall, J , jun , Drummore
1885 Marshall, Mathew, Bridgebank, Stranraer
1893 Mathieson, William, Mindork, Kirkcowan
1878 Matthews, A B , British Linen Bank, Newton Stewart
1877 MAXWELL, Sir H E , of Monreith, Bart , M P , Whauphill, N B
1887 Menzies, W M , Cults, Castle Kennedy
1875 Milroy, James, Galdenoch, Stoneykirk
1876 Milroy, John, Balgreggan Mains, Stranraer
1895 Morrison, David, Boreland, Kirkcowan
1895 Morrison, C Wm , Derry, Kirkcowan
1896 Murray, John, Kilfillan Glenluce
1893 Murray, William, Borrowmoss, Wigtown
1893 Nicholson, Andrew Kidsdale, Whithorn
1893 Niven, John F , Mahaar, Kirkcolm
1893 Parlane, John, of Craigdhu, Glasserton
1893 Pettigrew, James, Larg, Newton Stewart

Admitted
1885 Ralston, Robert, Milmain, Stoneykirk
1883 Ralston, Wm. H , Dunragit Estate Office, Dunragit, N B
1878 Rankin, Alex , Aird, Stranraer
1897 Ritchie, John, Lochans Mill, Lochans
1893 Robertson, James, Clendrie, Kirkcolm
1895 Ross, Samuel M , Torhousekie, Wigtown
1878 Routledge, C M , Banker, Port William
1878 Routledge, J J F , Old Mill, Port William
1870 Routledge, Wm , Elrig, Port William
1893 Salomon, William Thomas, Cornwall Park, Newton Stewart
1893 Shaw, David Burnie, Garlieston
1878 Smith, William, Garrarie, Port William
1893 Sprott, James, Mains of Dhuloch, Leswalt
1845†STAIR, The Earl of, K T , Lochinch, Castle Kennedy Station
1893 Stevenson, Robert, Glenside, Kirkcolm, Stranraer
1869†STEWART, Sir M J , of Southwick, Bart , M P , Ardwell
1846 Stewart, R H J , of Physgill and Glasserton, Whithorn
1893 Syminton, Thomas, Solicitor, Glenluce
1893 Taylor, Peter, Inchpark, Stranraer
1871 Thompson, Alex , Barmeal, Port William
1893 Thorburn, John, Port-of Spittle, Stoneykirk
1869 Todd, William, Auchness, Ardwell
1893 Tully, William, Colfin, Stranraer
1890 Wallace, James A , Claycrop, Kirkinner
1887 Watson, Allan Thomson, Belmont, Stranraer
1870 Whyte, James A , Kirkmabreck, Stranraer
1878 Wither, James, Lagganmore, Portpatrick
1894 Wither, Thos , Awkirk, Stranraer
1885 Wright, Hugh, of Alticry, Port William
1860 Young, J A., Orchardtown, Garlieston
1893 Young, William, Culnoag, Sorbie

7.—INVERNESS DISTRICT.

EMBRACING THE

COUNTIES OF CAITHNESS, ELGIN, INVERNESS, NAIRN, ORKNEY AND SHETLAND, ROSS AND CROMARTY, AND SUTHERLAND.

CAITHNESS.

Admitted
1874 Adam, Thomas, of Lynegar, Wick
1865 Brims, James, Thurso
1874 Brock, John, Princes Street, Thurso
1892 Brown, George, Watten Mains, Watten
1894 Dunnet, Alex., Upper Gillock, Wick
1894 Ferrier, Jas., Ackergill Mains, Wick
1899 Ferrier, John, Westerseat, Wick
1893 Geddes, Alex., Implement Maker, Wick
1883 Henderson, David P., of Stemster, Halkirk, N.B.
1874 Henderson, A. W., of Bilbster, Wick
1883 Henderson, Captain J. H., Rosebank, Wick
1881 Horne, Edward Wm., of Stirkoke
1892 Innes, Donald, Borlum, Reay, Thurso
1873 Irvine, G. F., Shrubbery Bank, Thurso
1871 M'Beath, James, Gerston, Thurso
1897 Macdonald, George, Pennyland, Thurso
1861 Miller, John, of Scrabster, Thurso
1894 Morris, Robt., Reiss Lodge, Wick
1881*†Portland, His Grace The Duke of, Langwell, Wick
1861 Purves, James, Barrogill Mains, Wick
1869 Purves, William, Thurdistoft, Thurso
1884 Robertson, Robert, Implement Maker, Wick
1881 Sandison, M., Hempriggs, Wick—*Free Life Member*
1894 Seton, Robert S., Rampyards, Watten—*Free Life Member*
1892 Sinclair, Alex., Quoys of Reiss, Wick
1857 Sinclair, Sir J. G. T., of Ulbster, Bart., Thurso Castle, Thurso
1886 Sinclair, Sir John R. G., of Dunbeath, Bart., Barrock House, Wick
1864 Sinclair, Sir Robert C., of Stevenson, Bart., Achvarsdale Lodge, Reay, Thurso
1855 Smith, James, of Olrig, Thurso
1870 Sutherland, Alex., Rampyards, Watten—*Free Life Member*

ELGIN.

1889 Adam, John, Coulardbank, Lossiemouth
1893 Adam, William, Chemical Works, Burghead
1893 Anderson, George H., Ironmonger, Elgin
1898 Anderson, John, Banker, Forres
1884 Anderson, Robert, Viewfield, Elgin
1879 Beattie, James, Earlsmill, Forres
1871 Black, James, LL.D., of Sheriffston, Elgin
1893 Brown, James, Miltonhill, Alves, Forres
1895 Brown, James Paterson, Innesmill, Urquhart, Elgin
1878 Bruce, D. C., Byres, Fochabers

Admitted
1864 Bruce, George, Woodside, Elgin
1884 Brydon, John, Forester, Rothes
1893 Clark, Donald, Blervie Castle Farm, Forres
1871 Colvin, Jas. E., Wester Manbeen, Elgin
1878 Cruickshank, David, Meft, Elgin
1875 Cruickshank, John, Solicitor, Elgin
1874 Cumming, Sir Wm. G. Gordon, of Altyre, Bart., Forres
1895 Dean, Alex., Jointure, Leuchars, Elgin
1894 Dean, Wm., Milton Brae, Elgin
1888 Edgar, James, Nether Bogside, Elgin
1885 Ferguson, George A., Surradale, Elgin
1893 Fettes, John, Westertown, Fochabers
1893 Fettes, William, Corskie, Garmouth
1893 Forbes, Robert, Woodhead, Forres
1895 Fraser, Alexander, Earnside, Alves, Forres—*Free Life Member*
1893 Fraser, William, Waterford Mills, Forres
1893 Fraser, William, Waterfolds, Elgin
1859 Garden, Arch., of Bernery, Forres
1890 Gilchrist, Wm., Leuchars, Elgin
1893 Grant, Charles, Salterhill, Elgin
1859*†Grant, Sir George Macpherson, of Ballindalloch, Bart.
1894 Grant, Jas., of Glen Grant, Rothes
1894 Grant, John, Bogg, Advie
1879 Grant, J., Mains of Advie, Advie
1894 Grant, Robt., Farmer, Cromdale
1893 Grant, Wm. R. (Buenos Ayres), Tullochgribbon, Grantown
1880 Haddon, P. M., St Mary's, Orton, Fochabers
1883 Henderson, Peter, Factor, Ballindalloch
1896 Hossack, Wm., Buntland, Orton, Fochabers
1864 Hunter, John, Dipple, Fochabers
1888 Hutcheson, James, W.S., Elgin
1897 Johnston, Lieut.-Col. Charles James, of Lesmurdie, Elgin
1893 King, William, Kingsmills, Elgin
1893 Knight, John, Park Place, Elgin
1896 Laing, Andrew, Brandston, Lochhill, Elgin
1895 Laing, William, Wallfield, Lochhill, Elgin
1893 Law, Arthur Woodland, Sanquhar Farm, Forres
1874 Lawrence, James, Forres Mills, Forres
1855 Lees, John, Grantown
1893 Leitch, Andrew, Gaisewell House, Alves, Forres
1858 Leitch, A. K., Inchstelly, Forres
1877 Leitch, Simon, Sunnybank, Forres
1893 M'Culloch, Alexander, Ardivot, Lossiemouth
1896 M'Gowan, Robert, Auction Mart, Elgin
1886 M'Gregor, Captain James, Balmenach Cromdale

Admitted
1870 Mackay, H. M. S , Banker, Elgin
1882 MACKENZIE, Sir F. C , Forres
1886 Mackenzie, Thomas, Carron, Strathspey
1898 Mackessack, Charles A , Asleisk, Forres
1898 Mackessack, Chas , Wester Alves, Forres
1882 Mackessack, George R , yr of Ardgye and Roseisle, Ardgye, Elgin
1874 Mackessack, John, Kinloss, Forres
1864 Mackessack, Robert, of Ardgye and Roseisle, Ardgye, Elgin
1882 Mackessack, R H , Newton of Struthers, Forres
1898 Maclean, George A., Hythehill, Elgin
1891 MacLeod, Captain Norman, of Dalvey, [illegible]
1876 M'William, James, Stoneytown, Keith
1898 Matheson, William, Muirton House, Kinloss, Forres
1898 Mathieson, Alex , Doonpark, Forres
1893 Mavor, George, Cluny, Forres
1872 Muirhead, George, Speybank, Fochabers
1894 Munro, Alex , The City Hotel Stables, Elgin
1894 Mutch, Jas , Deanshaugh, Elgin
1894 Neish, Wm , Merchant, Multen, Boharm
1894 Peterkin, Jas , 18 South Street, Elgin
1875 Peterkin, James Grant, of Grange, Forres
1894 Petrie, David, Gilston, Elgin
1871 Petrie, George, Rosehaugh, Elgin
1888 Petrie, George, Pitairlie, Elgin
1876 Petrie, W A., Rosebrae, Elgin
1895 Reid, Jas , Maverston, Urquhart, Elgin
1895 Reid, John, Gladhill Garmouth Elgin
1898 Robertson, Hugh, Balnageith, Forres
1896 Robertson, James, Auchinhalrig, Fochabers
1874 Robertson, Wm , 96 High Street, Elgin
1870 Robertson, Wm A , Mayfield, Forres
1883 Russell, Alex , Myrtleside, Elgin
1897 Scott, Peter, Drumbain Rothes
1874 Scott, Robert, Easter Manbeen, Elgin
1895 Sellar, William, Longhill, Elgin
1897 Shewan, William Cotts Lhanbryde
1893 Shiach, Gordon Reid, Surgeon Dentist, Elgin
1893 Simpson, William, Burnside, Fochabers
1896 Smith, James M , Silverhills, Drainie, Elgin
1894 Smith, Wm , The Pans, Elgin
1897 Souter, George, Greyfriars Iron Works, Elgin
1898 Stephen, Alexander, Coxton, Lhanbryde, Elgin
1894 Stewart, John, Rynballich, Cromdale
1893 Stuart, James, Garbity, Orton Elgin
1895 Stuart, James, Glen Spey Villa, Rothes
1877 Sutor, James, The Collie, Fochabers
1893 Tait, James, V S , Forres
1874 Thomson, J Grant, Grantown
1896 Thomson, Peter, Mains, Orton, Fochabers
1883 THURLOW, Right Hon Lord, Dunphail, Forres
1882 Urquhart, Robert, jun , Forres
1859 Walker, Robert, Altyre, Forres
1864 Walker, William, Auchray Buildings, Elgin
1883 Watson, H A , U P Manse, Forres—*Free Life Member*
1875 Watt, James, Rosebrae, Elgin
1870 Wight, Alexander, Ironmonger, Forres
1864 Yool, Thomas, Calcots, Elgin
1852 Young, Alex , Findrassie House, Elgin
1871 Young, James, Braelossie House, Elgin

INVERNESS.

1865 Anderson, James, Solicitor Inverness
1889 Anderson, William, Solicitor, Inverness

Admitted
1886 Baillie, A C , Dochgarroch, Inverness
1883 Baillie, James E B , of Dochfour, M P., Inverness
1891 Barron, James, Editor of the *Inverness Courier*, Inverness
1882 Baxter, Frederick, Seedsman, Inverness
1883 Bethune, Angus, Seafield, Inverness
1883 Birnie, Alex , Wellhouse, Beauly
1892 Birnie, John, Balnafettack, Inverness
1874 Biscoe, T Ramsay, of Newton, Kingillie, Inverness
1883 Black, Robert, C E , Inverness
1892 Boyd, Donald, Merchant, Fort William
1891 Cameron, Angus, Ben Nevis Auction Mart, Fort William
1859†Cameron, Donald, of Lochiel, Auchnacarry, Fort William
1881 Cameron, Duncan, 12 Church Street, Inverness
1895 Cameron, Francis, Lower Muckovie, Inverness
1890 Cameron, James, Coulnakyle, Nethy Bridge R S O
1892 Cameron James T , Aberchalder, Fort-Augustus
1871 Cameron, John, Auchindaul, Spean Bridge
1891 Cameron, John, Culreach Mains, Nethy Bridge, R S O
1896 Cameron, John, Mamore Cottage, Fort-William
1892 Cameron, Robert D , Lochgorm, Inverness
1884 Campbell, A D , of Kilmartin, Glen Urquhart
1891 Cattell, James, Balsparden, Fort-George Station
1898 Chisholm, George, 11 Queensgate, Inverness
1874 Chisholm, John, 8 Academy Street Inverness
1871 Cran, John, Kirkton Bunchrew, Inverness
1896 Cumming, William A , Allanfearn, Culloden Inverness
1893 Davidson, James, Inverness
1893 Davidson, John, Guisachan Home Farm, Inverness
1865 Davidson, Robert, Queensgate, Inverness
1883 Davidson, Samuel, Beechhill, Inverness
1883 Dick, W G , Horse hirer, Inverness
1887 Duncan, James Fern Villa, Inverness
1862†DUNMORE, Right Hon The Earl of, Isle of Harris
1874 Elliot, Matthew, Flesher, Inverness
1897 Ferguson, Donald, Lochboisdale
1890 Ferguson, Fergus, Monkstad, Uig, Portree
1896 Fletcher, Grant, Balnespick Kingussie
1894 Fraser, Alexander, Balloch, Culloden, Inverness
1894 Fraser, Alex , 63 Church Street, Inverness
1874 Fraser, Alexander, Inverness
1857 Fraser, Alex , Sheriff Substitute, Portree
1883 Fraser, David, Dalneigh, Inverness
1853 Fraser, Hugh, Balloch of Culloden, Inverness
1874 Fraser, James, C E , Inverness
1874 Fraser, James, Mauld, Beauly
1865 Fraser, William, Annfield, Inverness
1896 Garden, Norman M'Leod, Gollanfield, Fort George Station
1892 Garrioch, J T , Lovat Estates Office, Beauly
1860 Gordon, Geo , Land Surveyor, Inverness
1871 Grant, John, Inverlaidnan, Carr Bridge
1886 Grant, John Brown, Erchless, Beauly
1894 Grant, John Peter, of Rothiemurchus (Inverichnie, Banff)

Admitted
1896 Grant, Peter, Farmer, Carr Bridge
1874 Grant, Major Wm., Drumbuie, Glen Urquhart
1883 Grant, Wm. R., Solicitor, Inverness
1896 Gray, Donald, National Bank Buildings, Inverness
1875 Guild, James L., Strowan, Inverness
1882 Gunn, Alex., V.S., Beauly
1886 Honeyman, Thos., Auchnacarry, Spean Bridge
1865 Howden, John, Inverness
1883 Howe, Thomas, Parks of Inshes, Inverness
1874 Innes, Charles, Solicitor, Inverness
1883 Jones, R. E., Fassfern, Fort-William
1889 Kemble, Major, Knock, Skye
1883 Laurie, Robert, Eilean Cottage, Drumnurn, Inverness
1896 Lawson, George, Beaufort Home Farm, Beauly
1891 Linton, Andrew, Inchree, Onich, N.B.
1894 Livingston-Macdonald, Captain R. M., 3rd Seaforth Highlanders, Flodigarry, Isle of Skye
1892 Lovat, Lord, Beaufort Castle, Beauly
1897 M'Ainsh, James, Kinchurdy, Boat of Garten
1892 MacAinsh, John, Congash, Grantown
1897 MacArthur, D. G., M.D., Fort-William
1892 M'Bain, William, Piterrald, Drumnadrochet
1865 M'Bean, D., Auchterblair, Carr Bridge
1895 M'Bean, Daniel, Cradle Hall, Inverness
1885 M'Bean, William, Cradle Hall, Inverness
1889 Maccoll, Rev. Canon Hugh, Rosse Parsonage, Fort-William
1883 Macdonald, Alexander, Balintore, Bogroy
1884 M'Donald, Alex., Portree
1874 Macdonald, A. R., Ord, Isle of Ornsay
1872 Macdonald, D., The Lodge, Eigg
1893 M'Donald, D. D., Drumnadrochet, Glen Urquhart
1889 Macdonald, Hugh, Coach Proprietor, Fort-William
1896 Macdonald, John, Invernevis, Fort-William
1891 Macdonald, J. H., Charleston, Inverness
1897 M'Donald, Kenneth L., Skirinish, Skeabost Bridge, Isle of Skye
1883 Macdonald, William, Morayston, Petty, Inverness
1893 Macdonell, James Sidgreaves, Camusdaroch, Morar, Arisaig
1865 MacEwen, John C., Inverness
1893 Macfarlane, And., Viewfield, Kingussie
1879 M'Gillivray, Allan, Banchor, Kingussie
1874 M'Gillivray, John, Ballachroan, Kingussie
1876 MacGillivray, William, Eoligary, Barra
1877 M'Gregor, Archd., Glenforslan, Salen, Ardgour
1891 M'Intosh, Charles, Craggie, Inverness
1889 M'Intosh, Donald, West End Hotel, Fort-William
1889 MacIntosh, James, Factor, Ostaig, Isle Ornsay, Skye
1898 Mackay, Simon (D. Ross & Co.), Academy Court, Inverness
1893 M'Kenzie, Alex., C.E., Kingussie
1891 Mackenzie, Dr M. T., Scolpaig, Lochmaddy
1874 Mackenzie, N. B., British Linen Bank, Fort-William
1886 Mackenzie, Wm. D., of Farr, Inverness (Fawley Court, Henley-on-Thames)
1883 Mackintosh, A. D., of Mackintosh, Moy Hall, Inverness
1866 Mackintosh, C. Fraser, of Drummond, Inverness

Admitted
1844 Mackintosh, Æneas W., of Raigmore, Inverness
1844 Mackintosh, A., of Holme, Inverness
1883 Mackintosh, Hugh, 57 Eastgate, Inverness
1875 Maclean, Charles, Milton, Lochmaddy
1875 M'Leish, Daniel, Bank of Scotland, Fort-William
1893 M'Lennan, Alexander, Beechwood, Inverness
1883 M'Millan, E. H., Caledonian Bank, Inverness
1898 Macniven, Duncan, jun., Fort-William
1878 Macpherson, C. J. B., of Balavil, Kingussie
1887 Macpherson, Col. Ewen, of Cluny Macpherson, Kingussie
1870 Macpherson, Colonel Lachlan, of Glentruim, Newtonmore
1888 Macpherson, L. A., of Corrimony, Inverness
1883 Macpherson-Grant, John, Old Milton, Kingussie
1888 Macrae, Alexander D., Ruthven, Kingussie
1891 Macrae, Horatio Ross, W.S., of Clunes, Inverness (57 Castle St., Edinburgh)
1874 Macrae, Roderick, Postmaster, Beauly
1883 MacTavish, Alex., Implement Maker, Inverness
1869 Malcolm, George, Craigard, Invergarry
1883 Manners, C. R., C.E., Inverness
1883 Marr, Alex., Dalcross, Fort-George Station
1865 Martin, John, Docharn, Boat of Garten, Strathspey
1889 Martin, Nicol, of Glendale, Dunvegan
1883 Merry, A. W., of Belladrum, Beauly
1883 Merry, C. J., Belladrum, Beauly
1864 Munro, D., Milton, Fort-George Station
1874 Munro, John, Seedsman, Inverness
1898 Murray, Donald, 4 Falcon Square, Inverness
1890 Nicholson, Arthur Wm., Arisaig House, Fort-William
1893 Oberbeck, C., 25 Inglis Street, Inverness
1883 Paterson, Donald, Askernish, South Uist, Oban
1854 Peter, John, Croyard, Beauly
1883 Roberts, Wm., Highland Railway Co., Inverness
1874 Robertson, John, of Greshornish, Portree
1898 Robertson, J. G., 13 Falcon Square, Inverness
1894 Robertson-Macleod, K. M., of Greshornish, Isle of Skye
1890 Rose, Hugh Francis, of Holme Rose, Fort-George
1865 Rose, James, Mains of Connage, Fort-George Station
1865 Rose, John, Leanach, Inverness
1883 Ross, Alex., Architect, Inverness
1865 Ross, George, Viewfield, Inverness
1883 Ross, James, Solicitor, Inverness
1883 Ross, Wm., Seafield of Raigmore, Inverness
1892 Scott, David, Auctioneer, Inverness
1890 Shaw, Alexander, Farraline Mains, Inverness
1883 Shaw, Duncan, W.S., Inverness
1897 Sinclair, Robert, Factor, North Harris, Portree
1891 Sinton, P. J., Glennevis, Fort-William
1865 Smith, John, Inverallan House, Grantown
1884 Stewart, D. A., Ensay, Obbe
1887 Stewart, J. C., Glenmoidart, Moidart
1852 Stewart, John, of Ensay, Scorrybreck, Portree

Admitted
1896 Strother, Dr James, Balspardon, Fort George Station
1883 Stuart, W G, Inverness
1865 Sutherland, E C, Inverness
1884 TWEEDMOUTH, Right Hon Lord, Guisachan House, Beauly
1883 Tytler, Edward G F, of Aldourie, Inverness
1889 Urquhart, Farquhar, Seedsman, Inverness
1875 Walker, George A, Torbreck, Inverness
1883 Walker, George, Wood Merchant, Inverness
1886 Watson, James, 29 Southside Road, Inverness
1891 Weir, James, Achnacarry, Fort William
1896 Young, Colin, Gordon Square, Fort William

NAIRN.

1856 Anderson, Robert, of Lochdhu, Nairn
1878 Cameron, Dr James Angus, of Firhall, Nairn
1891 Clark, James, Golford, Nairn
1883 Clarke Lieut Col M A, Achareidh, Nairn
1888 Donaldson, H T, Banker, Nairn
1865 Dougall, Andrew, Nairn
1891 Fiddes, George Drumduan, Nairn
1892 FINLAY, Sir R B, of Newton, Q C, M P, Nairn
1852 Fraser, William, of Kilmuir and Newton Nairn
1894 Gowans, Charles F, Newton of Budgate, Cawdor, Nairn
1865 Joss, John, Budgate, Cawdor
1896 Macarthur, Alex, Nairnside, Cawdor, Nairn
1886 M'Intyre, Donald, Meikle Kildrummie, Nairn
1858 Mackillican, P, Achagour, Nairn
1891 Malcolm, William Househill, Nairn
1874 Mather, John Arres, Delnies Nairn
1891 Methven, Edward W, Hazelbrae, Nairn
1885 Mill, George, Piperhill Nairn
1892 Robertson, John, Horse hirer, Nairn
1873 Robertson, John S, Cawdor Estate Office, Nairn
1894 Robertson, William, Tomlunquhart, Nairn
1865 Rose, Major James, of Kilravock, Fort George Station
1894 Russell, James, Blackhills, Nairn
1894 Squair, Geo, Kildrummie, Nairn
1889 Walker, John Mackintosh, of Geddes, Nairn

ORKNEY AND SHETLAND.

ORKNEY

1854 Burroughs, Lieut General F W Traill, C B, of Rousay
1870 Cromarty, William, St Margaret s Hope, Orkney
1894 Davidson, William Henry Bain, Kirkwall
1872 Drever, James, Swanny House, Finstown
1884 Fortescue, William I, Swanbister, Kirkwall
1875 Gibson, John, Langskaill, Rousay
1896 Heddle, Peter Sinclair, Hillhead, Kirkwall
1888 Hossack, B H, Craigiefield, Kirkwall
1879 Johnstone, James, Orphir House, Orphir
1878 Learmonth, D H, Housebay, Stronsay
1892 MacLennan, William, Factor, Zetland Estates Office, Kirkwall
1887 Maxwell, Henry, How, Sanday
1884 Reid, Alfred, Braebuster, Kirkwall
1884 Scarth, Robert, Binscarth, Finstown, Orkney
1886 Sinclair, Thomas, Whitehall, Stronsay
1884 Stephen, Donald, Northtown, Birsay
1877 Stevenson, William, Holland, Stronsay
1894 Tait, John Papdale, St Ola Kirkwall
1878 Watt, W G T, Kierfiold House, Stromness

SHETLAND

1884 Anderson, Gilbert, Hillswick, Lerwick
1863 Bruce, John, of Sumburgh, Lerwick
1892 Edmonston, Laurence, Hallegarth Baltasound, Lerwick
1875 Edmondston, Mrs, of Buness, Unst, Lerwick
1881 Hamilton, Zachary Macaulay, Baltasound, Unst
1876 Jaffray, James, Belmont, Unst
1886 Manson, Anderson, Laxfirth, Lerwick
1891 Manson, Peter, Lunna, Shetland
1892 Pottinger, Sinclair, Grimsta, Lerwick
1876 Sandison, Alexander, Uyasound, Unst

ROSS AND CROMARTY.

1893 Adam, Hugh R, Balvaird, Muir of Ord
1870 Allan, William, Drummondreoch, Ferrintosh Conon Bridge
1895 Anderson, John Norrie, Stornoway
1883 Anderson, F A, Ballachraggan, Alness
1862 Arras, Walter, Fodderty, Dingwall
1896 Bain, Donald Applecross, Strome Ferry
1889 BELL Sir William James, of Scatwell, Muir of Ord
1892 Bignold, Arthur, of Loch Rosque, Achnasheen
1893 Binning, James, Keppoch, Dingwall
1886 Brown, Stephen, Killilan, Lochalsh
1887 Brown, Rev W L Wallace, The Manse, Alness
1896 Burness, Charles Munlochy
1883 Cameron, Archd, Killen, Avoch
1883 Cameron, Colin M Balnakyle, Munlochy
1869 Cameron Duncan, Banker, Tain
1891 Campbell G J, Sheriff Substitute, Stornoway
1896 Cameron John Killen, Avoch
1896 Cameron, Kenneth Murray, Balblair, Edderton
1893 Cuthbert, Thos W, Ardross, Alness
1865 Darroch Duncan of Gourock Torridon, Achnasheen
1861 Douglas, Thomas, Mains of Rhynie, Fearn
1874 Douglas, William, Arboll, Fearn
1895 Dudgeon, Alex Harper, Woodlands, Dingwall
1892 Duncan, William J, Solicitor, Dingwall
1884 Fletcher, J D, of Rosehaugh, Inverness
1898 Forbes Lachlan, Culcraigie, Alness
1898 Forsyth, Ian Asher, Ballintraid, Delny
1897 Fowler, John, of Mansfield, Tain
1883 FOWLER, Sir J A, of Braemore, Bart, Inverbroom House, Garve
1893 Fraser, Donald, jun, Balintore Hotel, Fearn
1893 Fraser, Malcolm F, Balaldie, Fearn
1892 Gallie, Abner, Morangie, Tain
1896 Gill, William Hope, Roskeen, Invergordon
1874 Goodbrand, James H, Culnaha, Nigg
1874 Gordon, J A, of Arabella, Nigg

Admitted
1875 Gordon, John, Cullisse, Nigg
1853 Grant, Kenneth, Craigellachie, Strath-
1893 Grant, William, Rarichie, Nigg
1893 Gunn, Edmund J., Solicitor, Dingwall
1875 Gunn, William, Strathpeffer, Dingwall
1898 Gunn, William Fred., Nutwood, Strathpeffer
1894 Henderson, Alex., Merchant, Dingwall
1883 Henderson, James, Culcairn, Invergordon
1884 Henderson, John, Factor, Fortrose
1889 Henderson, Thomas, Assistant Factor, Fortrose
1899 Hill, E. R., Socheye, Fearn
1879 Inglis, George, of Newmore, Invergordon
1885 Jackson, Major Randle, of Swordale, Evanton
1892 Linton, John, Castle Craig, Nigg
1883 Littlejohn, Alex., of Invercharron, Ardgay
1893 Logan, David, Auchtertyre, Strome Ferry
1889 Lumsden, John William, Navity, Cromarty
1898 Macdonald, Donald, Wilkhaven, Portmahomack
1895 M'Farlane, Robert, Tomich, Invergordon
1874 MacGregor, James G., Tain
1897 MacIntyre, Alex. Mackay, Brae, Dingwall
1875 MacIntyre, Robert, Newton, Evanton, N.B.
1875 M'Intyre, P. B., Mains of Findon, Conon Bridge
1877 Mackay, Henry, Shandwick Mains, Nigg
1893 Mackay, William, Brucefield, Portmahomack
1892 MACKENZIE, Sir A. G. Ramsay, of Coul, Bart., Strathpeffer
1872 Mackenzie, Andrew, of Dalmore, Alness
1895 Mackenzie, A. F., Inverbreakie, Invergordon
1865 Mackenzie, James Fowler, of Allangrange, Munlochy
1854†MACKENZIE, Sir Kenneth S., of Gairloch, Bart., Conon House, Conon
1892 Mackenzie, Murdo, Banker, Invergordon
1883 Mackenzie, William, Procurator-Fiscal, County Buildings, Dingwall
1875 Maclennan, Alex., Leanassie, Lochalsh
1888 M'Rae, Ewen M., Brahan Mains, Conon Bridge
1878 MacRaw, Donald, Alness
1887 MATHESON, Sir Kenneth J., of Lochalsh, Bart., Gledfield, Bonar
1892 Meiklejohn, John J. R., Novar, Evanton
1892 Methuen, John, Balmacara, Lochalsh
1881 MIDDLETON, Lord, Applecross, Lochcarron
1875 Middleton, A. A., Rosefarm, Invergordon
1864 Middleton, George, Cornton, Dingwall
1893 Middleton, George, jun., Docharty, Dingwall
1872 Middleton, Jon., Davidston, Invergordon
1872†Middleton, Jon., Clay of Allan, Fearn
1898 Middleton, Thomas, Farness, Invergordon
1893 Middleton, Walter Ross Taylor, Solicitor, Dingwall
1875 Mitchell, Andrew, Ratagan House, Lochalsh
1897 Monro, Capt. D., of Allan, Fearn
1881 Mundell, Walter, Moy, Muir of Ord
1870 Mundell, W. G., Inverlael, Lochbroom
1883 MUNRO, Sir Hector, of Foulis, Bart., Dingwall

Admitted
1893 Munro, Hector, V.S., Fearn
1877 Munro, John, of Lemlair, Dingwall
1892 Munro, Stuart C., of Teananich, Alness
1891 Murdoch, Alex., Dalnavie, Alness
1875 Murdoch, James, Drynie Mains, Inverness
1884 Murray, Charles, of Lochcarron, Dingwall
1883 Murray, William, Kilcoy, Muir of Ord
1892 Ness, Charles, Auchindunie, Alness
1893 Paterson, Alex., Ardullie, Dingwall
1874 Paterson, Wm. G., Ord, Invergordon
1898 Perrins, C. W. Dyson, Ardross Castle, Alness
1898 Peterkin, James B., Mountrich, Dingwall
1879 Peterkin, W., Dunglass, Conon Bridge
1884 Pirie, A. G., of Leckmelm, Ullapool
1884 Reid, N., New Kelso, Strathcarron, Ross-shire
1869 Robertson, Chas., of Kindeace, Invergordon
1895 Robertson, John Cameron, Achilty, Strathpeffer
1874 Robertson, John, Mountegle, Fearn
1893 Ross, A. M., Editor of the *North Star*, Dingwall
1895 Ross, Donald, Balnagown Arms Hotel, Tain
1872 Ross, George, Merchant, Dingwall
1893 Ross, George A., Rhynie, Fearn
1893 Ross, George, Bayfield, Nigg
1893 Ross, Hugh, Banker, Tain
1876 Ross, James, Pollo, Delny, R.S.O.
1874 Ross, John, Meikle Tarrel, Fearn
1893 Ross, John, Railway Contractor, Fearn
1892 Ross, John F., Pitcalnie, Nigg
1884 Ross, William, Kinnahaird, Strathpeffer
1892 Scott James, Fearn
1892 Shoolbred, Walter, of Wyvis, Evanton
1898 Simpson, David William, Arcan Mains, Muir of Ord
1896 Smart, Arthur G., Scotsburn, Parkhill, Ross-shire
1864 Smith, Alexander P., Munlochy Farm, Munlochy
1897 Spence, Alexander O. Stewart, Seafield, Fearn
1897 Stephen, James. Glenmorangie Distillery, Tain
1892 Stewart, William, Alness Ferry, Resolis, Invergordon
1883 Stirling, John, of Fairburn, Muir of Ord
1891 Stirling, Major William, yr. of Fairburn, Kinellan Lodge, Strathpeffer
1888 St Quintin, Geoffray Aspley, Cromarty
1895 Stuart, David, Estate Office, Munlochy
1875 Trotter, R., Garguston, Muir of Ord
1898 Urquhart, Chas., Ironmonger, Dingwall
1898 Urquhart, Jas., Shantullich, Munlochy
1894 Urquhart, Thos., of Delny, C.E., Delny Station
1891 Walker, William, Contullich, Alness
1866 Warrand, Colonel A. J. C., Ryefield, Ferintosh
1892 Wilson, Hugh, Milton of Noth, Rhynie
1875 Young, James, Cadboll, Fearn

SUTHERLAND.

1865 Barclay, Thomas, Skelbo Castle, Dornoch
1893 Box, John, Tongue, Sutherland
1876 Brebner, Robert, Skibo Mains, Dornoch
1884 Cameron, Alexander, Drummie, Golspie
1893 Campbell, J. R., Shinness, Lairg
1883 Clarke, G. G., Eriboll, Lairg
1856 Dudgeon, John B., Crakaig, Loth

Admitted	
1883	Gunn, John, The Hermitage, Golspie
1851	Hill, Robt., Navidale House, Helmsdale
1874	Hill, Robert Robertson, Navidale House, Helmsdale
1899	Macaulay, A. N., Banker and Factor, Golspie
1850	M'Iver, Evander, Scourie House, Lairg
1890	Mackintosh, John, Proncy, Dornoch
1888	M'Lean, Donald, Dunrobin, Golspie
1844	Menzies, Duncan, Blairech, Lairg
1874	Mitchell, James R., Culgower, Loth
1863	Mitchell, Wm., Ribigill, Tongue
1897	Murray, William, Inveran Cottage, Invershin
1893	Rose, Alex., Coul, Dornoch
1892	Sellar, P., Culmaily, Golspie
1883	Shaw, James T., Gordonbush, Brora
1896	Trotter, William, Harvieston, Kinbrace

8.—BORDER DISTRICT.

EMBRACING THE

COUNTIES OF BERWICK, PEEBLES, ROXBURGH, AND SELKIRK.

BERWICK.

Admitted
1892 Aitchison, Wm., Kames, West Mains, Greenlaw
1854 Allan, John, Peelwalls, Ayton
1893 Bertram, George William, Heughead, Reston
1874 Bertram, John, Addinston, Lauder
1866 Bolam, Robt. George, Berwick-on-Tweed
1885 Boswall, Sir G. Houstoun, of Blackadder, Bart., Chirnside
1867 Bromfield, W. J., of Old Greenlaw, Greenlaw
1891 Broomfield, George L., Solicitor, Lauder
1888 Brown, Colonel, of Longformacus, Duns
1898 Brown, James, Tweedhill, Berwick-on-Tweed
1893 Brown, Robert, Cammo Foundry, Duns
1872 Brownlie, Alexander, Haughhead, Earlston
1883 Brydon, Thos. T., Burncastle, Lauder
1898 Cabry, Tom, Shidlaw, Coldstream
1884 Calder, T. A., Billie Mains, Chirnside
1872 Calder, W. A., Oxenrig, Coldstream
1898 Campbell, Alex., Westwood, Duns
1880 Carmichael, John, Coldstream
1898 Carter, Thomas (Carter & Sons), Berwick-on-Tweed
1898 Caverhill, Joseph M., Hillend, Reston
1889 Cookson, C. L. Stirling, of Renton, Grant's House
1872 Cowe, Peter, Butterdean, Grant's House
1870 Cowe Robert, Summerhill, Ayton
1881 Craw, H. H., West Foulden, Berwick
1899 Darling, Alexander, Governor's House, Berwick-on-Tweed
1880 Darling, Thomas, 1 Palace Street East, Berwick
1896 Davidson, Robert, Harcarse, Duns
1882 Dickenson, Robert, Longcroft, Lauder
1859 Dickenson, Wm., Longcroft, Lauder
1891 Dodds, Robt., Blackadder Bank, Chirnside
1863 Dodds, William, Elwartlaw, Greenlaw
1898 Doughty, James T. S., Ayton
1863 Dryden, William, Coldstream
1898 Dunglass, Lord, The Hirsel, Coldstream
1887 Dykes, Thomas, Press Mains, Reston
1889 Edington, William, East Mains, Milne Graden, Coldstream
1898 Elder, John, Jardinefield, Whitsome
1854 Elder, W., Implement Works, Berwick-on-Tweed
1898 Elliot, Frank, Middlestots, Duns
1884 Elliot, William, Ellemford, Duns
1897 Everett, F. H., Edington Mains, Chirnside
1882 Ferguson, J., Duns Castle Estate Office, Duns
1898 Fleming, John, Craigsford Mains, Earlston

Admitted
1898 Fleming, John, Bowerhouse, Oxton, Lauder
1897 Forrest, Robt. Jack, Stewartslaw, Chirnside
1884 Fulton, John, Hatchednize, Coldstream
1878 Gibb, Robert Shirra, Boon, Lauder—*Free Life Member*, 1885
1864 Gibson, J., Brown's Bank, Eyemouth
1893 Gillies, John, Edington Mills, Chirnside
1882 Gilroy, James, Berwick-on-Tweed
1894 Grieve, Andrew, Flass, Lauder
1898 Hardy, George, Old Cambus, Cockburnspath
1880 Henderson, Robert, East Gordon, Gordon
1881 Herbertson, Robert H., Fans, Earlston
1893 Hogg, George, Blackhouse, Edrom
1892 Hogg, Robert, Fireburn Mill, Coldstream
1893 Hogg, Wm., jun., Clackmae, Earlston
1860†Home, Right Hon. The Earl of, The Hirsel, Coldstream
1874 Home, Col. D Milne, of Wedderburn, Caldra, Duns
1895 Home, David William Milne, yr. of Wedderburn, Paxton House, Berwick
1898 Home, J. H. Milne, Caldra, Duns—*Free Life Member*
1880 Hood, James, Cove, Cockburnspath
1854 Hood, T., Coldstream Mains, Coldstream
1884 Hood, Thos., Factor, Coldstream
1895 Hood, Thomas, jun., Bogend, Duns
1877 Hood, W., The Cove, Cockburnspath
1879 Hope, A. Peterkin, of Sunwick, Berwick
1886 Hope, Col. Charles, of Cowdenknowes, Earlston
1876 Hunter, Jas., of Antonshill, Coldstream
1892 Inglis, Alex., Westwood, Reston—*Free Life Member*
1857 Johnston, James, Huntingdon, Lauder
1893 Johnstone, Robert Fender, Law House, Coldingham
1898 Kedzie, Thos., West Morriston, Earlston
1886 Laurie, John H., Hardens, Duns
1884 Leadbetter, H. M., Legerwood, Earlston
1899 Lillico, Richard, Market Place, Coldstream
1859 Lockie, William, Choicelee, Duns
1884 Logan, Adam S., Ferney Castle, Reston
1899 Lunn, John, Upper Blainslie, Lauder
1893 Lyall, Alex., Greenknowe, Gordon
1898 M'Bain, Alexander, Implement Dealer, Coldstream
1863 Macbraire, J., of Broadmeadows, Berwick
1891 M'Donald, Dan., Hawkslaw, Coldstream
1898 M'Dougal, George, Bassendean, Gordon
1898 M'Dougal, Jas., Eccles Tofts, Greenlaw
1898 M'Dougal, John, Lylestone, Lauder
1898 Mackay, John, Wyndhead, Lauder
1885 M'Lean, David, Estate Office, The Crooks, Coldstream

Admitted	
1884	MacNab, John, of Swinton, Coldstream
1881	Mack, Joseph, of Berrybank, Reston
1899	Meikle, Peter, Market Place, Coldstream
1870	Menzies, John, Bankhead, Duns
1894	Michael, Reginald Warburton, Crosbie, Earlston
1884	Middleton, Hilton, Kimmerghame Mains, Duns
1898	Middleton, William, Cocklaw, Ayton
1898	Mill, George, Hyndsidehill, Lauder
1889	Millican, Gilbert T., Harelaw, Chirnside
1898	Milne, Robert P., Spital Mains, Berwick-on-Tweed
1898	Milne, Wm., Foulden Newton, Berwick-on-Tweed
1872	Muirhead, Frank, Paxton, Berwick
1893	Murray, James, Brockholes, Grant's House
1893	Murray, Thomas, Brockholes, Grant's House
1880	Nisbet, George, Rumbleton, Greenlaw
1870	Nisbet, Jas., of Lambden, Greenlaw
1872	Paterson, James, Kidshielhaugh, Duns
1880	Porteous, James, Solicitor, Coldstream
1893	Purdie, Adam, Cranshaws, Duns
1872	Rae, Robt., Burnbank, Foulden, Berwick
1878†	REAY, The Right Hon. Lord, Carolside, Earlston
1898	Roberts, Harry L., of Chapel-on-Leader, Earlston
1892	Robertson, William, Blinkbonny, Earlston—*Free Life Member*
1872	Rutherford, A., Rumbleton Law, Gordon
1899	Scott, J., Oil Mills, Berwick-on-Tweed
1890	Scott, Thomas, Ellem House, Ellemford, Duns
1861	Simson, George, Courthill, Kelso
1863	Smith, Alex., Letham, Berwick
1890	Smith, Andrew, of Whitchester, Duns
1864	Smith, F. C., Hoprig, Cockburnspath
1872	Smith, J. F., Darnchester, Coldstream
1898	Somers, Thomas A. Munro, Square, Duns
1880	Somervail, J. A., Broomdykes, Chirnside
1891	Spence, Arthur Geo., Whitelaw, Edrom
1874	Stephenson, Richard, Chapel, Duns
1898	Stephenson, Thomas, Chapel, Duns
1898	Stokoe, Thomas, Tweed Iron Works, Berwick-on-Tweed
1884	Swan, Robert G., Shawbraes, Reston
1880	Swinton, J. L. Campbell, of Kimmerghame, Duns
1855	Thomson, James, Mungoswalls, Duns
1899	Thomson, Ralph, Merchant, Berwick-on-Tweed
1885	Thomson, Samuel, Manderston, Duns
1863	Torrance, T., Whitsome Laws, Edrom
1898	Torrance, Thomas, jun., Hutton Hall Barns, Hutton, Berwick
1894	Turnbull, George Gillon, of Abbey St Bathans, Grant's House
1884	Tweedie, David, Nether Howden, Lauder
1894	Watson, J. M., Marygold, Edrom
1877	Weatherhead, Wm., Preston, Duns
1898	Webster, John, Edrom-Newton, Edrom
1898	Weddell, John, jun., The Barns, Lauder
1863	Weddell, John Wilkie, Lauder Barns, Lauder
1885	Welsh, Alex., Seedsman, Coldstream
1863	White, A., Kelloe Mains, Edrom
1880	White, E. C., Ayton Law, Ayton
1889	Wilkie, Jas. Bruce, of Foulden, Berwick
1898	Wilkie, John, of Pilmuir, Coldingham
1898	Wilson, James Hood, Commission Agent, Duns
1862	Wilson, J., Chapelhill, Cockburnspath
1864	Wood, James, Bigham, Coldstream
1874	Wyllie, James, Pathhead, Cockburnspath

PEEBLES.

Admitted	
1898	Aitken, Thomas, Stewarton, Eddleston
1873	Anderson, John, Cramalt, Selkirk
1898	Balfour, F. R. S., Dawyck House, Stobo
1884	Ballantyne, Wm., Wormiston, Eddleston
1882	Beresford, J. G. M., of Macbiehill, Lamancha
1872	Brown, Wm., Elderscroft, Springhill, Peebles
1884	Cairns, John, Eshiels, Peebles
1881	Carmichael, G. H. G., Castle Craig, Dolphinton
1898	Clarkson, Alex., Skirling Mill, Biggar
1898	Clarkson, Robert, Burnetland, Broughton
1892	Constable, George W., Traquair Estate Office, Innerleithen
1874	Dickson, W. L., Drumelzier Haugh, Biggar
1898	Douglas, George, Earlypier, Eddleston
1884	Dyson, F. W., Chapelhill, Peebles
1874†	ELIBANK, Right Hon. Lord, Darn Hall, Eddleston
1884	Ellis, John, Waterhead, Eddleston
1887	Erskine, Rear-Admiral James E., of Venlaw, Peebles
1882	FERGUSSON, Sir James R., of Spitalhaugh, Bart., West Linton
1880	Forrest, George, Edston, Peebles
1881	GIBSON-CARMICHAEL, Sir T. D., of Skirling, Bart., M.P , Castle Craig
1876	Gordon, Charles, of Hallmyre, Lamancha
1884	Gracie, Charles A., Easter Happrew, Stobo
1882	Greenshields, David, Garvald, Dolphinton
1894	Jack, Geo., Callands, Mountaincross, Peeblesshire
1893	Macpherson, Donald, Edderston, Peebles
1898	Marshall, H. B., of Rachan, Broughton
1885	Maxwell, James, Stobo Estate Office, Stobo
1898	Mitchell, Thomas, Boreland, Eddleston
1843	MONTGOMERY, Sir G. Graham, of Stanhope, Bart., Stobo Castle, Stobo
1846	Montgomery, John B. H., Stobo Castle, Stobo
1852	Muir, G. W., Kirkhouse, Traquair
1889	Newbigging, Thomas, Corstane, Biggar
1898	Patrick, James, Mailingsland, Peebles
1898	Purdie, James G., Hamildean, Stobo
1881	Ritchie, G. D , Chapelgill, Broughton
1898	Russell, William, Bonnington, Peebles
1898	Scott, William, Glebe, Eddleston
1851	Stewart, James, Noblehall, Lamancha
1880	Stodart, Thomas Tweedie of Oliver, Broughton
1898	Stuart, Walter, Kingledores, Broughton
1858	TENNANT, Sir Chas., of The Glen, Bart., Innerleithen
1890	Tennant, Edward P., yr. of The Glen, Innerleithen
1877	Thom, Alex., Chapelhill, Peebles
1886	Thorburn, M. G , of Glenormiston, Innerleithen
1898	Thorburn, Walter, of Glenbreck, M.P., Kerfield, Peebles
1889	Thorburn, William, Craigerne, Peebles
1898	Tudhope, J., Broughton Place, Broughton
1898	Tudhope, William, Milkieston, Eddleston
1860	Tweedie, James, of Quarter, Biggar
1850	Welsh, Alexander, Mossfennan, Broughton
1898	Wilkie, Alex., Harcus, Eddleston
1878	Williamson, Miss Katharine Isabella, of Cardrona, Peebles
1884	Wilson, James, West Mains, Dolphinton
1860	Woddrop, W. A., of Garvald, Dolphinton

ROXBURGH.

Admitted
1872 Alexander, George, Lilliesleaf
1898 Anderson, Robert B., of Glenburn Hall, Jedburgh
1898 Bain, William, Legars, Kelso
1897 Balfour, C. B., of Newton-Don, Kelso
1884 Ballantyne, David, Shaws, Newcastleton
1898 Ballantyne, R., East Middle, Hawick
1860 Ballingall, George, Clarilaw, St Boswells
1863 Balmer, Thomas, Melrose
1898 Balmer, William, Mellerstain Mill, Smailholm
1886 Beattie, John, Braidlie, Newcastleton
1898 Bell, John A., Ploughlands, St Boswells
1885 Bell, William Scott, yr. of Woll, Hawick
1889 Boyd, Andrew, F.R.C.V.S., Melrose
1861 Boyd, John B., of Cherrytrees, Kelso
1863 Boyd, W. B., of Faldonside, Melrose
1898 Brotherstone, Andrew, Easter Muirden, Kelso
1880 Brown, J., Hundalee, Jedburgh
1884 Brown, James, Land Steward, Floors, Kelso
1889 Bruce, John, Easter Langlea, Galashiels
1866 Brunton, James, Broomlands, Kelso
1862 Brydon, Adam, Mounthooly, Jedburgh
1863 Burn, John, Newhouse, Yetholm
1899 Burnet, Alex., Greensidehall, Hawick
1898 Carr-Ellison, J. S., Hallrule, Hawick
1876 Carre, T. A. R., of Caverscarre, St Boswells
1871 Caverhill, John, Jedneuk, Jedburgh
1867 Charlton, M., jun., Browndeanlaws, Jedburgh
1872 Croall, John, Coach Works, Kelso
1872 Cunningham, C. J., of Muirhouselaw, Wooden, Kelso
1884 Cunningham, Robt., Glendouglas, Jedburgh
1888†DALKEITH, The Earl of, Eildon Hall, St Boswells
1865 DALRYMPLE, Hon. G. Gray, of Elliston House, St Boswells
1889 Davidson, Alexander, Auctioneer, Melrose
1898 Davidson, Andrew, Auctioneer, Melrose
1898 Davidson, Mark Turnbull, Colmslie, Galashiels
1898 Davidson, Richard, Swinnie, Jedburgh
1872 Davidson, Wm., Colmslie, Galashiels
1863 Dodd, James, Hundalee Cottage, Jedburgh
1863 Dodd, Nicholas, Nisbet, Jedburgh
1898 Douglas, Andrew, Riccalton, Jedburgh
1893 Douglas, Captain Edward Palmer, of Cavers, Hawick
1889 Douglas, Francis, Springwood Park, Kelso
1871 Douglas, George, Upper Hindhope, Jedburgh
1867 Douglas, George Sholto, 5 Abbotsford Grove, Kelso
1898 Dove, George, St Boswells Bank, St Boswells
1862†Dudgeon, J. Scott, Longnewton, St Boswells
1898 Dunn, David, Roxburgh Mains, Roxburgh
1876 Dunn, John, Ramsay Lodge, Kelso
1898 Dunn, William, Redden, Kelso
1880 Elliot, James, of Flex, Hawick
1893 Elliot, John, Hindhope, Jedburgh
1884 Elliot, Robert, Hermitage, Newcastleton
1874 Elliot, Robert Henry, of Clifton Park, Kelso
1893 Elliot, Thomas, Attonburn, Kelso
1893 Elliot, Thomas Robert Barnewall, yr. of Clifton Park, Kelso

Admitted
1898 Elliot, William, Middles, Lilliesleaf
1872 Elliot, Wm. B., of Benrig, St Boswells
1878 Erskine, Charles, Melrose
1884 Fairbairn, J. J., of Shieldfield, St Boswells
1889 FAIRFAX, Rear-Admiral Sir Henry, C.B., of Old Melrose
1884 Fleming, John, Roan, Newcastleton
1872 Forsyth, James (Hooper & Co.), Kelso
1893 Forsyth, Robert, New Smailholm, Kelso
1855 Gardner, Robert, Gattonside, Melrose
1894 Goodfellow, A., High School, Kelso
1884 Grierson, Robert, Whitechesters, Hawick
1878 Grieve, C. J., of Rashiegrain, Branxholm Park, Hawick
1890 GRIFFITH, Sir Richard Waldie, of Hendersyde Park, Bart., Kelso
1895 Haddon, Andrew, Honeyburn, Hawick
1880 Haddon, Walter, Solicitor, Hawick
1884 Hall, David, Larriston, Newcastleton
1889 Hamilton, George, Abbey Hotel, Melrose
1898 Hardy, William, jun., Harperton, Kelso
1897 Hart, Andrew D., The Flatt, Kershopefoot, Carlisle
1892 Hay, Athole S., of Marlfield, Roxburgh
1889 Henderson, James, Estate Manager, Old Melrose, Melrose
1893 Henderson, J. Graham, Weensforth Mill, Hawick
1895 Hogarth, William Gray, Linton, Bankhead, Kelso
1898 Hogg, John, jun., Forrest Lodge, Kelso
1898 Hoggarth, John, Heiton Mill, Kelso
1898 Holliday, John, Dunlaybyre, Newcastleton
1898 Horsburgh, Charles E., Broomlands, Kelso
1898 Huie, H. Peckett, Goshen House, Kelso
1898 Hunter, John, Lempitlaw, Kelso
1889 Hutton, John, V S., Kelso
1898 Jacks, Richard, Ancrum Mains, Jedburgh
1898 JEDBURGH, Lord, Monteviot, Jedburgh
1887 Johnston, John S., Crailinghall, Jedburgh
1889 Johnston, Wm. Lee, Oxnam Neuk, Jedburgh
1890 Karr, H. Seton, of Kippielaw, M.P., St Boswells
1893 Kennedy, Daniel, 20 Horse Market, Kelso
1896 Kennedy, William, Kinninghall, Hawick
1833 Kerr, Major R. S., of Chatto, Sunlaws, Kelso
1890 Kidd, Henry, of Kerr, Lowood, Melrose
1898 Laidlaw, James, Allars, Jedburgh
1863 Laing, George, Tweedbank, Kelso
1880 Laing, Thomas (Laing & Mather), Kelso
1880 Laing, Walter, Kershaugh, Jedburgh
1872 Lawrie, Thomas, Ormiston Road, Melrose
1898 Logan, Robert John, Fairnington, Roxburgh
1869*†LOTHIAN, The Marquis of, K.T., Monteviot, Jedburgh
1898 M'Kinnon, Peter, Gatehousecots, Bonchester Bridge, Hawick
1883 Macpherson, Donald, Burnhouse, Jedburgh
1893 Mather, R. V. (Laing & Mather), Kelso
1880 Maxwell, John, Coachbuilder, Kelso
1892 Mein, Jas. A. W., of Hunthill, Jedburgh
1868 Mein, Ben., Roxburgh Barns, Roxburgh
1893 MINTO, the Earl of, Minto House, Hawick
1886 Moffat, James, Whitehaugh, Hawick
1863 Murray, John, of Wooplaw, Galashiels
1898 Murray, R. J., Barnhills, Minto, Hawick
1898 Murray, William, Trows, Roxburgh
1898 Murray, Wm. R., Charterhouse, Kelso
1860 Ogilvie, George, Holefield, Kelso

Admitted
1886 Oliver, Andrew R., Thornwood, Hawick
1889 Oliver, Geo. Lindsay, The Border Club, Hawick
1852 Oliver, James, of Thornwood, Hawick
1880 Oliver, John (Borthaugh), Hawick
1897 Oliver, John, Lynwood, Hawick
1853 Oliver, Robert, of Blakelaw, Lochside, Kelso
1893 Oliver, Captain William James, Hoselaw, Kelso
1878 Oliver, William M., Langraw House, Hawick
1868 Park, James, Bishopflat, Melrose
1889 Paton, Major James, of Crailing, Jedburgh
1863*†POLWARTH, Right Hon. Lord, Mertoun, St Boswells
1889 POLWARTH, The Hon. The Master of (Humbie House, Upper Keith)
1898 Porteous, Ronald, Maxton Eastend, St Boswells
1854 Pott, Gideon, of Dod, Knowesouth, Jedburgh
1895 Price, W. M., Minto Estates Office, Hawick
1893 Purdom, Finlay, Borthaugh, Hawick
1898 Rae, James William, Colmsliehill, Galashiels
1898 Ramsay, David Ogilvie, Jedneuk, Jedburgh
1856 Rawdin, Joseph, Chemist, Jedburgh
1863 Rea, Charles, Cleithaugh, Jedburgh
1872 Renwick, John, Nurseryman, Melrose
1894 Ritchie, D. N., of The Holmes, St Boswells
1898 Roberton, James, Morebattle Tofts, Kelso
1898 Roberton, John, Ladyrig, Roxburgh
1898 Roberton, R. A. (Penny & Kay), Kelso
1893 Roberts, George, Whitelee, Galashiels
1880 Ross, Richard, Rutherford, Kelso
1893 Routledge, Richard, Gorrenberry, Newcastleton
1884 Rutherfurd, W. E. Oliver, of Edgerston, Jedburgh
1889 SCOTT, The Hon. H. J., Brotherston, St Boswells
1883 SCOTT, Hon. J. C. Maxwell, of Abbotsford, Melrose
1898 Scott, Arthur Francis, of Howcleuch, Pinnaclehill, Kelso
1884 Scott, Chas., Milsington, Hawick
1863 Scott, George, Kersknowe, Kelso
1882 Scott, H. J. E., of Makerston, Kelso (Weston, Underwood, Derby)
1898 Scott, Jas., Softlaw, East Mains, Kelso
1894 Scott, John, Newton, Hawick
1898 Scott, John, Ploughlands, Jedburgh
1889 Scott, John Robson, yr. of Newton, Jedburgh
1898 Scott, Robert C., Graden, Kelso
1863 SCOTT, Sir W., of Ancrum, Bart., Jedburgh
1899 Scott, T. W. Robson, Lanton Power, Jedburgh
1894 Shepherd, David, Hardies Mill Place, Kelso
1899 Simson, Thomas, Lilly Bank, Jedburgh
1898 Simson, William, Oxnam Row, Jedburgh
1883 Sinclair, C. G., Grahamslaw, Kelso
1879 Smith, James, Kelso
1893 Smith, James, of Olivebank, St Boswells
1880 Smith, John, Galalaw, Kelso
1888 Smith, J. R. C., Mowhaugh, Kelso—*Free Life Member*
1881 Smith, R. C., Ormiston, Jedburgh
1887 Smith, Thomas A., Bedrule, Jedburgh
1887 Sprot, Lieut.-General John, of Riddell, Lilliesleaf
1851 Stedman, James, Timpendean, Jedburgh

Admitted
1897 Stevenson, Allan, Secretary Border Union Society, Kelso
1880 Storie, W. G. R., Newtown, St Boswells
1899 Strachan, J., Jedburgh
1898 STRATHEDEN and CAMPBELL, Lord, Hartrigg, Jedburgh
1897 Sword, John, Normanie, Jedburgh
1846 Tait, James, Banker, Kelso
1893 Taylor, William, Ashybank, Hawick
1897 Teacher, Donald M., c/o Geo. Ballingall, Clarilaw, St Boswells
1867 Thomson, A., of Mainhill, St Boswells
1899 Thomson, Thomas, Hopton, Ancrum, Jedburgh
1897 Thomson, W. H., Over Roxburgh, Roxburgh
1889 Tress, George Russell, Whitelee, St Boswells
1894 Tress, William Maxwell, Faughill, St Boswells
1899 Turnbull, Alexander Bell, Sunlawshill, Kelso
1863 Turnbull, J., Eastfield, Kelso
1899 Turnbull, James, Hendersyde, Kelso
1898 Turnbull, John, jun., Berryhill, Kelso
1898 Turnbull, John, Sunlawshill, Kelso
1889 Turnbull, Mark, Melrose
1863 Turnbull, W. Geo., Spittal, Jedburgh
1898 Turner. Francis R., Mervinslaw, Jedburgh
1872 Usher. Thomas, Courthill, Hawick
1880 Waddell, Alex., of Palace, Jedburgh
1898 Walker, Alex., Chemist, Jedburgh
1898 Watson, John, Greatridge Hall, Kelso
1893 Watson, Robert F., Briery Yards, Hawick
1889 Watson, T. Lindsay, Leaburn, Hawick
1886 Watson, Capt. W. S., of Burnhead, Hawick (care of T. Usher, Courthill, Hawick)
1890 White, Alex., Nottylees, Kelso
1898 Wilson, Charles John, Deanfield, Hawick

SELKIRK.

1866 Anderson, B. T. G., of Tushielaw, Selkirk
1863 Anderson, G., of Hawthorn Bank, Selkirk
1889 Anderson, S. Scott, of Shaws, Selkirk
1863 Brown, Adam. Hyndhope, Selkirk
1880 Cochrane, A. L., of Kingsknowes, Galashiels
1893 Cochrane, Walter, Leynahurst, Galashiels
1897 Cochrane, William E. A., Lynhurst, Galashiels
1889 Connochie, Thomas D., V.S., Galashiels
1877 Connochie, William Dixon, V.S., Selkirk
1899 Coombe, George, Linglie, Selkirk
1871 Dun, John, Galashiels
1869 Elliot, A. T., Newhall, Galashiels
1889 Elliot, John, Meigle, Galashiels
1860 Elliot, Walter, Hollybush, Galashiels
1889 Gibson, Thomas, jun., Torwoodlee, Galashiels
1873 Grieve, James, Howden, Selkirk
1885 Grieve, James, jun., Fernielee, Selkirk
1895 Hall, Robert, Kiln Knowe, Galashiels
1875 Howatson, J. L., Ramsaycleugh, Selkirk
1878 Laidlaw, Robert, Rodono, Selkirk
1849 Lang, Hugh M., of Broadmeadows, Selkirk
1878 Lang, Robert J., Broadmeadows, Selkirk
1889 Lawrence, David, Whytbank, Galashiels
1878 Lindsay, John V., Whitehope, Selkirk
1873 Linton, Simon, Oakwood, Selkirk

Admitted	
1888	Macfarlane, James, Ashiestiel, Galashiels
1880	Mitchell, Thomas, Howford, Selkirk
1880	Muir, John, Dryhope, Yarrow, Selkirk
1889	Noble, Robert, of Borthwickbrae, Hawick
1893	Paton, E. D., Sintonparkhead, Hawick
1885	Plummer, Chas. H. S., of Sunderland Hall, Selkirk
1868	Pringle, J. T., of Torwoodlee, Galashiels
1898	Riddell, David, The Rink, Galashiels
1880	Riddell, John, Rink, Galashiels
1880	Scott, John, of Gala, Galashiels
1881	Scott, John Corse, of Synton, Hawick
1872	Stavert, Archibald, of Hoscote, Hawick
1896	Steedman, John, County Clerk, Selkirk
1880	Turnbull, James, The Glebe, Selkirk
1899	Wigan, Lewis D., Hoscote, Hawick

ENGLAND.

Admitted

1855 Alexander, John, 9 Raymond Terrace, Cheltenham

1873 Ancaster, The Earl of, Normanton Park, Stamford

1873 Anderson, J., Bradbury, Enville, Stourbridge

1850 Anderson, Robert Hood, Devonshire Club, London

1893 Anderton, Geo. Herbert, Kelpin Lodge, Howden, Yorks

1863 Angus, John, Whitefield, Morpeth

1896 Anstruther, Arthur W., 28 St Leonard's Terrace, Chelsea, London, S.W.

1864 Archer, Thomas, 1 Westminster Chambers, Victoria Street, London

1897 Armstrong, Thos., High House, Carlisle

1897 Ashby, S. F., 20 Crosby Road, Birkdale, Southport—*Free Life Member*

1873 Ashdown, A. H., Uppington, Wellington, Salop—*Free Life Member*

1863 Askew, Wilson, of Pallinsburn, Coldstream

1883 Aveling, T. L., Rochester

1890 Bamford, Henry, jun., Leighton Iron Works, Uttoxeter

1899 Barber, Robert, African Chambers, 19 Oldhall Street, Liverpool

1895 Barford, James G. (of Barford and Perkins), Peterboro

1880 Barrett, Robert Bell, Skipton Castle, Skipton

1896 Barron, James, The Lodge, Home Farm, Tyburn, Birmingham—*Free Life Member*

1899 Beattie, James C., Kingside Hill Abbey, Carlisle

1872 Bell, And., Hilgay, Downham Market, Norfolk

1898 Bell, J. P. F., Fulforth, Witton Gilbert, Durham

1877 Bell, T. (Messrs Robey & Co.), Lincoln

1898 Bell, William, Ratcheugh, Alnwick

1884 Benson, R. A., Duchy of Cornwall Office, Liskeard, Cornwall—*Free Life Member*

1833 Bethune, Colonel R., of Uydie, 21 Earl Court Square, London, S.W

1882 Bigg, Thomas, Great Dover Street, London

1885 Birch, W. de Hoghton, Hoghton Estate Office, Walton Hall, Preston—*Free Life Member*

1874 Bird, Ebenezer, Ramornie, Kington, Herefordshire

1865 Black, Major Alexander, 7 Wilberforce Road, Finsbury Park, London, N.W.

1898 Black, James, New Ladykirk, Norham-on-Tweed

1859 Black, John, Ford, Northumberland

1893 Blackstone, Edward Christopher (Blackstone & Co., Limited), Stamford

1875 Blackwood, Alex., Estate Office, Leadenham, Lincoln

1863 Bolam, John, Bilton, Lesbury, Northumberland

1883 Bonallo, W. C., Estate Office, Locko Park, near Derby

Admitted

1879 Bonnor, G. H., 14 Cockspur Street, Pall Mall, London, S.E.

1864 Borton, John, Barton House, Malton

1875 Brotchie, G., Grinkle, Loftus, R.S.O.

1877 Brown, John, Morden Farm, Hertford

1873 Browne, Colvile, M.R.A.C., 2 Plantation Cottages, Hextable, Kent—*Free Life Member*

1884 Brydon, John, Seed Merchant, Darlington

1873 Brydon, Robert, The Dene, Seaham Harbour—*Free Life Member*

1875 Bullock, Matt., 48 Prince's Gate, London, S.W.

1870 Burdett-Coutts, Baroness, 1 Stratton Street, Piccadilly, London

1896 Burkitt, William, N.E.C.S., Barnard Castle—*Free Life Member*

1877 Burr, John M., Writtle Park, Ardinstor, Essex

1894 Burrell, Charles, jun., Thetford, Norfolk

1891 Cairns, Thos M., 3 Wentworth Terrace, Great Corby, Carlisle

1878 Cameron, H. E., 42 Cromwell Avenue, Highgate, London

1863 Campbell, A. H., Cornwall Gardens, London, S.W

1863 Campbell, G. W., 22 Queen's Gate, London, S.W.

1838 Campbell, Sir James, Bart., Wheatmead Park, Lydney

1892 Campbell, J. R., Yorkshire College, Leeds—*Free Life Member*

1895 Campbell-Gilmour, T., Estate Office, Edenhall, Langwathby, R.S O., Cumberland

1894 Carlisle, Countess of, Naworth, Brampton, Cumberland

1880 Carnegie, Wm. C., Sarsden, Chipping Norton

1878 Carr, Robert, Cheswick Lodge, Beal, R S.O.—*Free Life Member*

1887 Carrington, George, M.R.A.C., Missenden Abbey, Great Missenden, Bucks—*Free Life Member*

1838 Carstairs, D., Hailes House, Fairfield, Liverpool

1877†Cecil, Lord Arthur, Orchardmains, Tunbridge

1877 Cecil, Lord Lionel, Orchardmains, Tunbridge

1884 Chambers, T. W., Prospect House, Pelutho, Abbeytown

1877 Clark, James, Somerby, Grantham

1884 Clark, J. M., Featherstone Castle, Haltwhistle

1873 Clark, William, New Mousen, Belford

1893 Clarke, Thomas, Greenfoot, Sebergham, Carlisle

1884 Clinton, W. E. Pelham, Moore Court, Stroud—*Free Life Member*

1851 Colville of Culross, Right Hon. Lord, K.T., 41 Eaton Place, London

1877 Corbett, T., Perseverance Iron Works, Shrewsbury

Admitted
1891 Coward, T. A., Eden Town, Carlisle—*Free Life Member*
1879 Crabb, Wm., Silloth, Cumberland
1890 Crabtree, Henry, Moss House, Heywood —*Free Life Member*
1875 Craig, H. V. Gibson, The Prebendall House, Aylesbury
1880 Craig, James, Moat House Farm, Biscot, Luton, Beds
1882 Craig, Robert, Crondon Park, Billerican, Essex
1860 Crawford, Daniel, Potterells Farm, Hatfield, Herts
1898 Crawford, Lionel W., Hepple, Rothbury, Northumberland
1896 Crombie, Walter G., Church Farm, Eversley, Winchfield, Hants
1880 Cross, Alexander, c/o John Picard & Co., 59 Mark Lane, London, E.C.
1898 Crossman, L. Morley, Goswick, Beal, R.S.O., Northumberland
1893 Crow, Philip Mansfield, Howden, Yorks
1876 Cruickshank, J. W., Coombe Head, Haslemere, Surrey
1868 Cruikshank, Edward C., Shrublands, Graffham, Petworth, Sussex
1898 Cryer, John, 172 St Leonard's Road, Girlington, Bradford—*Free Life Member*
1882 Cunningham, T. D. S., Isle of Caldy, Tenby, South Wales
1893 Cuthbert, Thomas W., Churston, Devon
1894 Daine, Herbert S., 7 Hyde Park Place, London, W.—*Free Life Member*
1894 Davidson, D. J. Russell, 28 Victoria Street, London, S.W.
1890 Davidson, William, Cattle Salesman, Cornhill-on-Tweed
1894 Davidson, William, Tithe Hill, Cornhill-on-Tweed
1895 Davidson, William, Margam, Port Talbot, So. Wales—*Free Life Member*
1887 Davies, Edward Smith, Atchley, near Shifnal—*Free Life Member*
1859 Dawson, J., Cleveland House, Salop Road, Welshpool, Montgomeryshire
1869 Dickie, Joseph, The Bank House, The Broadway, Tooting, London, S.W.
1886 Dickson, Thos. A., Estate Office, Overstone Park, Northampton—*Free Life Member*
1895 Dixon, Albert Alexander, Tanwood House, Chaddesley Corbett, near Kidderminster, Worcestershire—*Free Life Member*
1894 Dixon, T., jun., Leadhill, Stocksfield-on-Tyne
1849 Dixon, Thomas G., Dolbon, St Asaph
1880 Dollar, T. A., V.S., 56 New Bond Street, London
1871 Donne, Henry, Leek Wootton, Warwick
1885 Douglas, Wm., 29 Farringdon Road, London
1861 DRUMMOND, Hon. F., 58 St George's Square, London
1874 Duff, G. Smyttan, 58 Queen's Gate, South Kensington, London, S.W.
1882 Duncan, John W., Coldrey, Bentley, Farnham, Surrey
1884 Dunn, James, Gilling Grange, Richmond, Yorks
1898 Dunn, William, Grindon, Norham-on-Tweed
1871 Eden, Henley, Woodstock, Ascot, Berks
1878 Edmondson, T., 144 Princes Street, Old Garratt, Manchester
1895 Egginton, Arthur, South Ella, Hull
1873 Eley, Rev. Dr Wm. H., Deene Rectory, Nr. Wansford, Northamptonshire—*Free Life Member*

Admitted
1875 ELLESMERE, The Right Hon. The Earl of, Worsley Hall, Manchester
1873 Elliot, Prof. Thos. J., The Pebbles, Glebe Lands, Hunstanton, Norfolk—*Free Life Member*
1882 Ensor, Thos. H., 54 South Street, Dorchester—*Free Life Member*
1882 Esson, Robert, Zenda Cottage, Ashtead, Surrey
1886 Faber, Alfred D., Belmont, Ilfracombe—*Free Life Member*
1886 Farish, James, 463 Mile End Road, London, E.
1894 Fielding, J. B., Downing, Holywell, North Wales
1897 FitzHerbert, William, Nettleworth Manor, Mansfield, Notts
1891 Fleet, Wilfrid J., Wellingore Hall, Lincoln—*Free Life Member*
1881 Fleming, Hugh, Felmersham, Bedford
1891 Forbes, A. C., the Home Farm, Bowood, Calne, Wilts—*Free Life Member*
1894 Forrester, James John, Bryanston, Blandford, Dorset—*Free Life Member*
1898 Fraser, Samuel, 12 Gilmore Street, Shaw Heath, Stockport—*Free Life Member*
1854 Friar, Thomas, of Grindon Ridge, Norham-on-Tweed
1888 Galashan, Alfred, 32 Ashley Road, Upton Park, London, E.
1873 Galashan, Charles C., 32 Ashley Road, Upton Park, London, E.
1892 Gascoigne, Major R. F. T., Letherton Hall, Aberford, Leeds
1877 Gell, H. C. Pole, Hopton Hall, Wirksworth
1879 Gibson, J. G., 1 Vanburgh Park, Blackheath, London
1889 Gilchrist, D. A., University Extension College, Reading—*Free Life Member*
1882 Gilkes, Gilbert, Canal Iron Works, Kendal
1873 Goddard, H. R., Fairfield, Illogan, Redruth—*Free Life Member*
1875 Gordon, W. R. G., Barsham Lodge, Sandown, Isle of Wight
1866 Gough, William, Land Agent, Wykeham
1881 Gover, L. D., 30 Bernard Street, Russell Sq., London, W.S.—*Free Life Member*
1886 Gow, George, Tregothnan Office, Truro
1881 Graham, George, Palletts Farm, Newport, Essex
1873 Graham, Robert G., Beanslands Park, Irthington, *viâ* Crosby-on-Eden, Carlisle
1888 Graham, William, Eden Grove, Kirkbythore, Penrith
1882 Grahame, Thomas, Glencairn, Knollys Road, Streatham Hill, London
1897 Gray, John, New Club, Cheltenham
1891 Greenbank, Jonathan C., Estate Office, Kelmarsh, Northampton
1895 Greenwood, Thomas P., Cononley, *viâ* Keighley, York—*Free Life Member*
1854 Gregory, A. A., 12 Gatestone Road, Upper Norwood, London, S.E.
1892 Greig, Robert Blyth, Cheshire Agricultural and Horticultural School, Holmes Chapel
1892 Griffen, Hugh Reid (W. A. Wood & Co.), 36 Worship Street, London
1898 Gwillam, Robert, Agricultural College, Aspatria—*Free Life Member*
1834 Gwynne, A. T. J., of Monachty, Cardigan
1898 Hacking, Thomas, 50 Beddington Street, Nelson, Lancashire—*Free Life Member*
1892 Haldane, Fred., Barlees, Cornhill-on-Tweed

Admitted
1877 Hall, T. F., Billiter Buildings, Billiter Street, London, E.C.
1867 Hallen, Vety. Lieut.-Col., F.R.S.E., F.R.C.S.E., Pebworth Fields, Stratford-on-Avon
1888 Hamilton H. W., Lilleshall, Newport, Salop—*Free Life Member*
1888 Handley, John, Greenhead, Milnthorpe
1887 Handley, William, Greenhead, Milnthorpe, Westmoreland
1884 Hardy, C. W. L., Gittisham, Honiton—*Free Life Member*
1867 Harris, William, Rowlands Castle, Hants
1897 Harrison, George, The Hall, Gainford, Darlington
1895 Harrison, John, Chatsworth House, Carlisle
1875 Haughton, W. H., Highlands, Gt. Barford, St Neots,
1887 Haviland, W. A., Warbleton, Heathfield, Sussex
1883 Hayward, C. P., Beaumont Manor, Lincoln
1878 Henderson, John, Estate Office, West Dean, Chichester—*Free Life Member*
1854 Henderson, Thos., Hastings Cottage, Seaton Delaval, Newcastle-on-Tyne
1881 Henderson, W., East Elrington, Haydon Bridge, Carlisle—*Free Life Member*
1877 Herdman, George, The Abbey Farm, Massingham
1883 Hetherington, H. B., Carlisle
1896 Hewison, Robert, Agricultural College, Aspatria—*Free Life Member*
1873 Hill, A. J., St Keverne, Harrow-on-the-Hill—*Free Life Member*
1894 Hill, Henry F., Agricultural College, Aspatria—*Free Life Member*
1897 Hill, J. Smith, Principal, Agricultural College, Aspatria
1873 Holliday, Jonathan, Kirkbampton, Carlisle
1878 Holliday, Wm., Pelutho West House, Abbey Town, Carlisle
1882 Holm, Alex., Lawrence's Farm, Buckland, Betchworth, Surrey
1897 Holm, Alex., jun., Buckland, Betchworth, Surrey—*Free Life Member*
1875 Holm, John, Waterend, Ongar, Essex
1886 Hooper, C. H., Highlands Farm, Swanley, Kent—*Free Life Member*
1878 Hope, John W., c/o Lever Brothers, Ltd., Port-Sunlight, Birkenhead
1878 Hornsby, J., Spittalgate Ironworks, Grantham
1898 Howard, J. H., Britannia Iron Works, Bedford
1863 Howie, H. B., North Hazelrigg, Belford
1897 Howie, James L., Harris Institute, Preston—*Free Life Member*
1865 Hudspith, Wm., Green Croft, Haltwhistle
1879 Hunt, A. E. Brooke, Merton Grange, Slough, Bucks—*Free Life Member*
1898 Hunter, Chas. E., Selaby, Gainford, Darlington
1893 Hunter, William, Regent Street, Lutterworth, Leicestershire
1895 Hurley, George, County Technical Office, Stafford—*Free Life Member*
1883 Hutchinson, Alan, 30 Church Street, Durham
1888 Inman, A. H., care of Glyn, Mills, Currie, & Co., 67 Lombard Street, London, E.C.—*Free Life Member*
1895 Irving, John, Mossband, Rockliffe, Carlisle
1893 Irwin, Major T. A., Lynehow, Carlisle

Admitted
1870 Jackson, John, 11 Offerton Road, Clapham, S.W.
1895 Jamieson, Robert, Broughton House, 273 Norwood Road, Herne Hill, London, S.E.
1898 Jones, C. B., University College of North Wales, Bangor—*Free Life Member*
1873 Juckes, R. F., Harley, Much Wenlock—*Free Life Member*
1876 Keith, Lieut.-Col. Jas., Capel Hall, Frimley, Ipswich
1894 Kennaway, David, The Farm, Cramlington, Northumberland
1875 Kennedy, W., Lewes and County Club, Lewes—*Free Life Member*
1883 Kenyon, J. W., Oxly Woodhouse, Fartown, Huddersfield
1874 Kidd, H., V.S., Biggin Hall, Thurlaston, Rugby
1862 Kilpatrick, P., 32 Old Kent Road, London
1894 Laidlaw, Percy O., West Fell, Corbridge-on-Tyne
1889 Laidlaw, Thomas R., Chrishall Grange, Royston, Herts
1897 Laing, George, The Grange, New Etal, Cornhill-on-Tweed
1868 LAWES, Sir John B., Bart., Rothamstead, St Albans
1878 Leggat, Alex., Brocas, Hever, Edenbridge, Kent
1875 Lightfoot, H. Le Blanc, Corpus Christi College, Oxford
1891 Lister, Joseph, Little Broughton, Carlisle—*Free Life Member*
1893 Little, James, jun., Lime-Tree House, Longtown, Cumberland
1885 Lockhart, Peter, Estate Office, Edenhall, Langwarthby, R.S.O., Cumberland
1885 LONDONDERRY, K.G., Most Noble The Marquis of, Seahamhall, Seaham Harbour
1896 LONG, Right Hon. Walter H., M.P., President of the Board of Agriculture, 4 Whitehall Place, London, S.W.
1881 Lonsdale, Claud, Rose Hill, Carlisle
1835 LOPES, Sir Massey, Bart., 28 Grosvenor Gardens, London
1843 Lorimer, T. W., Hyde Cottage, Torr Street, Buxton, Derbyshire
1850 Lowndes, Major Jas., Junior United Service Club, London
1884 Lyal, William, Myton Grange, Helperby, York
1850 Lyall, Robert, 48 Upper Parliament St., Liverpool
1888 Lyon, George, Ingatestone, Essex
1878 M'Connell, P., Ongar Park Farm, Ongar—*Free Life Member*
1878 M'Cracken, W., Crewe—*Free Life Member*
1886 M'Creath, H. G., Galagate House, Norham-on-Tweed
1898 M'Creath, James, Bosvigo Farm, Truro—*Free Life Member*
1841 Macdonald, Lieut.-Gen. Alister M'Ian, 27A Park Lane, London, W.
1891 Macdonald, Charles, *The Field* Office, Breams Buildings, London, E.C.
1898 M'Dougall, James T., F.E.S., Dunollie, Blackheath, London
1894 MacGregor, Dr A., 7 Harley Street, Cavendish Square, London, W.
1879 M'Gregor, Alex., Leigh, Lancashire
1865 Macgregor, Thos., The Chestnuts, Brandenburgh Road, Sunnerbury, W.
1875 Mackay, Thomas, Westwood, Coventry
1882 M'Kerrell, R. M., Junior Carlton Club, Pall Mall, London
1874 M'Kerrow, A., Bradshaw House, Bradshaw, Halifax, Yorks

Admitted
1846 Mackintosh, G. G., Richmond House, Twickenham
1880 M'Laren, John, Hunslet, Leeds
1846 Macleay, Alex. D., Conservative Club, London, W.
1865 M'Lennan, Donald, 42 Sackville Street, Piccadilly, London, W.
1883 M'Leod, J. M., 2 Hilldrop Road, Camden Road, London, N.
1886 M'Minnies, Henry H., Farington, Preston—*Free Life Member*
1870 M'Monies, J., Coombelands, Addlestone, Surrey
1865 MACNAGHTEN, Sir Steuart, Bitterne Manor House, Southampton
1870 M'Naughton, D., 79 Mark Lane, London, E.C.
1875 Maddison, H., The Lindens, Darlington
1870 Main, G. Agnew, Portland Square, Carlisle
1884 Malcolm, John, M.R.C V.S., Birmingham—*Free Life Member*
1880 Mangin, W. Nangreave, Preston, Chathill
1861 Mangles, Geo., Givendale, Ripon, Yorkshire
1884 Marriott, T. E., Newnham House, Daventry
1868 Marshall, James, Gainsborough
1877 Martin, E., Wimbledon, London
1897 Mason, William G., Marsh Grange, Kirkby-in-Furness, Carnforth—*Free Life Member*
1888 Massey, Fred. J., 54 Bunhill Row, London
1884 MAXWELL, Hon. B. C., 20 Montagu St., Portman Square, London, W.
1870 MAXWELL, Sir John R. Heron, Bart., Secretary Alliance Insurance Co., St James Square, London
1896 Meggitt, H. A., Woodside, Mansfield
1894 Meiklejohn, D. W., Wyndyard Park, Stockton-on-Tees
1891 Menzies, Robert, Merton, Thetford
1889 Middleton, T. H., University College of Wales, Aberystwith—*Free Life Member*
1877 Millican, J., Wedholm House, Abbey Town
1873 Mitchell, John, 6 Clarendon Square, Leamington Spa
1861 MONTAGU of Beaulieu, Lord, Palace House, Beaulieu, Southampton
1885 Moore, George, Blakemoor, Cresswell, Morpeth
1878 Moubray, J. M., Sutton Iford, Lewes, Sussex
1880 Moult, John, Royal Buildings, Newcastle-on-Tyne
1877 Mounsey, Wm. R. Lowther, Newton, Penrith
1888 Muir, James, South Haven, Beach Road, Weston-Super-Mare—*Free Life Member*
1895 Murray, James, of Traquhair, Manchester and Salford Bank, Manchester
1873 Murray, James, Junior Carlton Club, London
1896 Ness, John, c/o R. Errington, Victoria Mills, Sunderland
1872 Newton, T. H. G., Barrels Park, Henley-in-Arden, Birmingham
1878 Nicholson, W. N., Newark
1882 Nickels, John Tetley, The Day House, Shrewsbury
1893 Nimmo, William, Castle Eden, Co. Durham
1892 Noel, Ernest, Lydhurst, Haywards Heath, Sussex
1860 Norman, William, Sattenham, Milford, Godalming, Surrey—*Free Life Member*

Admitted
1879 North, G. F., Strathfieldsaye, Mortimer, R.S.O., Berks
1858 Ogilvie, Wm. R., Ormside, Appleby, Westmoreland
1874 Ogilvy, John F., 13 Collingham Gardens, London, S.W.
1872 Oliphant, L. J., Guards' Club, London
1875 Ord, J. R., Haughton Hall, Darlington
1894 Parkin-Moore, Wm., Whitehall, Mealsgate, Carlisle
1867 Paterson, C., Canford Manor, Wimborne
1857 Paton, A., Norwood, Sydenham, London
1888 Perkins, W. F., M.R.A.C., Portswood House, Southampton—*Free Life Member*
1889 Pilkington, Claude M., Harewood, Leeds
1873 Pitblado, Charles B., 5 Eastfield Drive, Aigburth Road, Liverpool
1885 Pollock, Tho., Manor House, Nettlebed, Henley-on-Thames
1893 Powell, J. E., Cambrian Iron Works, Wrexham
1883 Quibell, W. O., Highfield House, Newark
1898 Rackham, Stanley, Agricultural College, Aspatria—*Free Life Member*
1870 Ralston, A. R., Mill Closs, Catterick Bridge, Catterick, Yorkshire
1892 Rand, John, South Benington, Beal
1878 Ransome, James Edward, The Orwell Works, Ipswich
1870 Rawline, John D., 44 Clarence Road, Birkdale, Southport
1878 Reay, Thomas, Abbey Town, Carlisle
1857 Redfern, W. Macquarrie, Conservative Club, St James Street, London
1877 Rennie, John, Askham, Retford
1878 Richardson, R. A., 128 Shiel Road, Newsham Park, Liverpool
1888 Richmond, Jas. G., Globe Works, Southhall Street, Manchester
1880 Riddle, Andrew, Yeavering, Wooler
1899 Ridley, Matthew A., Hawkhope, Falstone, Northumberland
1852 Rintoul, Chas., Strawberry Hall, Buxted, Sussex
1886 Robertson, Charles T. A., Little Horringer Hall, Bury St Edmunds—*Free Life Member*, 1888
1861 Robertson, S. S., 2 South Ter., Penzance, Cornwall
1878 Robinson, Thos., Cargo, Carlisle
1884 Robson, Jacob, Byrness, Otterburn
1881 Rodger, Geo., Newton Bank, Preston Brook
1873 Rome, Thos., Charlton House, Charlton Kings—*Free Life Member*
1879 Roscoe, Wm C., Ash House, Whitchurch, Salop
1870 Ross, J., The Grove, Ravenglass, Carnforth
1871 Russell, James M., Strawberry Hall, Buxted, Sussex
1870 Ryric, R., 34 Park St., Grosvenor Sq., London
1898 Sargeant, Thomas Charles, Cattle Market Road, Northampton
1888 Scott, Adam, Fawdon, Glanton, Northumberland
1889 Scott, Alex., Whinfell Park, Penrith
1893 Scott, Robert, Wyndham Hotel, Bootle, Liverpool
1872 Selby, B. P., Paston, Coldstream
1890 Sessions, Harold, Tongdean, Brighton—*Free Life Member*
1863 SHAND, Right Hon. Lord, 32 Bryanston Square, London, W.
1898 Shuttleworth, Alfred (Clayton & Shuttleworth), Lincoln
1897 Sims, John Dilwyn, Orwell Works, Ipswich

Admitted

1896 Sinclair, Jas., Editor 'Live Stock Journal,' 9 New Bridge Street, London, E.C.
1878 SINCLAIR, The Right Hon. Lord, 55 Onslow Square, London, S.W.
1885 Slater, Andrew, Osborne, Isle of Wight
1895 Smith, Lavid Lister, Bierley Lane, Dudley Hill, Bradford, Yorks—*Free Life Member*
1864 Smith, Robert, 14 Bramham Gardens, London, S.W.
1895 Smith, Thomas, Blacon Point, Chester
1873 Smith, Thos. K., 50 Greystone Road, Carlisle
1892 Solomon, F. O., Durham College of Science, Newcastle-on-Tyne—*Free Life Member*
1881 Somerville, William, B.Sc., Durham College of Science, Newcastle-on-Tyne —*Free Life Member*, 1887
1893 Spencer, Sanders, Holywell Manor, St Ives, Hunts
1887 Stanhope, John Montague Spencer, Cannon Hall, Barnsley, Yorkshire
1869 Statter, T., Stand Hall, Whitefield, Manchester
1885 Steel, Alexander, Southend, Essex
1884 Stephen, H. C., Avenue House, Finchley, London
1880 Stephenson, C., V.S., Sandyford Villa, Newcastle
1875 Stevenson, Alex. S., Oatlands Mere, Weybridge, Surrey
1853 Stewart, J. A. Shaw, 71 Eaton Place, London
1868 Stewart, Neil P., Vaynol, Bangor, North Wales
1877 Stirling, A., 30 Eccleston Street, London, S.W.
1884 Stordy, Norman, Thurstonfield Tannery, Carlisle
1895 Sutton, Alfred, Bridekirk, Cockermouth
1865 Swanwick, R., R.A.C. Farm, Cirencester
1894 Tait, Richard E., Newbigging, Norham-on-Tweed
1896 Taylor, Alex., Roseville, Hale Road, Farnham, Surrey
1895 Thomas, Gwyn Reid, Ivy Cottage, Hillingdon, Uxbridge — *Free Life Member*
1888 Thompson, Henry, V.S., Aspatria
1883 Tiffen, J. H., Conservancy Buildings, Hull—*Free Life Member*
1894 Tipper, Charles J. R., Agricultural College, Aspatria—*Free Life Member*
1889 Toppin, John C., Musgrave Hall, Skelton, Penrith
1891 Townley-Parker, T. Townley, Cuerdon Hall, Bamber Bridge, Preston
1896 Townshend, Joseph H., Fellougley, nr. Coventry—*Free Life Member*
1866 Trotter, T. C., 54 Park Street, Grosvenor Square, London, W.
1859 Turner, Frederick J., Mansfield, Woodhouse, Mansfield, Notts
1889 Turner, Thos. Warner, Welbeck, Worksop, Notts
1878 Twentyman, J. M., Hawkrigg House, Wigton, Cumberland
1877 Unite, John, 291 Edgeware Road, London, W.
1877 VANE, Sir H R., of Hutton in the Forest, Bart., Penrith

Admitted

1897 Wakerley, Fred., Durham College of Science, Newcastle-on-Tyne—*Free Life Member*
1896 Walker, Francis P., Upper Gornal, Dudley, Staffs.—*Free Life Member*
1872 Walker, J. P. S., Littlegate, Oxford
1889 Walker, Thomas G., Hyde Hall, Buntingford, Herts
1873 Wall, George Y., Durham — *Free Life Member*
1898 Walters, J. Tudor (Mills & Co.), Granville Road, Leicester
1878 Walton, G. K., Long Campton, Shipston-on-Stour—*Free Life Member*
1894 Ward, Martin H., Colonel Gamble's Estate Office, Corporation Street, St Helens, Lancashire—*Free Life Member*
1883 Wardman, Robert, Warwick Bank House, Carlisle
1896 Waters, Arthur, Coopersale, Epping, Essex
1896 Waterson, D. M., Lupton, Churston, S. Devon
1886 Webb, Major W. G., of Woodfield, Wordsley, Stourbridge
1881 Weber, F. H., Granthams, Chiddingfield, Godalming—*Free Life Member*
1897 Webster, Herbert, Morton House, Fence Houses
1894 WEDDERBURN, Sir W., of Ballendean, Bart., M.P. for Banffshire, Meredith, Gloucester
1860 Welsh, John, Rudfen Manor, Kenilworth
1863 WHARNCLIFFE, Right Hon. Lord, 15 Curzon Street, London
1891 White, W. E C., Manor Farm, Beedon, Mewbury—*Free Life Member*
1894 Whittaker, John D., Oxford and Cambridge Club, Pall Mall, London, S.W. —*Free Life Member*
1898 Williams, David D., Agricultural College, Aspatria—*Free Life Member*
1854 Willis, T., Manor House, Carperby, Bedale
1859 WILSON, Sir Jacob, Chillingham Barns, Alnwick—*Free Life Member*, 1873
1896 Wilson, R. Riddell, 17 Queen Street, London, E.C.
1892 Wilson, William, Goodyhills, Maryport —*Free Life Member*
1873 Wilson, William, Leigh, Lancashire
1858 Wilson, William, Borough, Sanderstead, Croydon, Surrey
1896 Wilton, James P., 143 Hartington Road, Sefton Park, Liverpool — *Free Life Member*
1895 Winter, H. L., Hull Oil Manufacturing Co., Limited, Stoneferry, Hull
1881 Woodroffe, D., Chace View, Rugeley
1876 Wordsworth, R. W., Whitemoor House, Ollerton, Notts
1897 Wyllie, Alexander, Cravens, Wemington, Lancashire
1896 Wyllie, Scott, Moorhouse, Rickerby, Carlisle
1896 Young, David, Ellen Bank, Mealsgate, Wigton, Cumberland
1879 Young, R. W., Billeswell Manor, Litterworth
1878 Young, Wm., 81 Drummond Street, Euston Square, London, N.W.
1876 Young, William S., The Beacons, Ingatestone, Essex
1877 ZETLAND, Earl of, Aske, Richmond, Yorkshire

IRELAND.

Admitted
1893 **Ballingall, Robert Rennie**, Adare, Limerick
1868 **Bruce, Robert**, Royal Dublin Society, Dublin
1873 **Campbell, Geo.**, Kilkea, Mageny, Co. Kildare—*Free Life Member*
1872 **Cranston, James**, Home Farm, Pakenham Hall, Castlepollard
1877 **Fennessy, Thos.**, Grange Villa, Waterford
1838 **Fox, Richard M.**, of Foxhall, Rathowen
1876 **Gilchrist, And.**, Grovedale, Golden Ball, Co. Dublin
1884 **Goulding, W. J.**, Fitzwilliam Square, Dublin

Admitted
1876 **Maconchy, J. A.**, Kildare Street Club, Dublin—*Free Life Member*
1870 **Paterson, Alex.**, Townnakeady, Ballinrobe, Mayo
1889 **Purefoy, Edward B.**, Greenfields, Tipperary—*Free Life Member*
1883 **Robertson, Thomas**, Chairman, Board of Works, Dublin
1871 **Roy, Fred Lewis**, Wellpark, Oughterard, Co. Galway
1889 **Smyth, Chas. A**, Enagh Lodge, Londonderry
1898 **Wade, Thomas**, Newcastle West, Co. Limerick—*Free Life Member*

THE COLONIES.

1887 **Banerjee, N. N.**, Calcutta—*Free Life Member*
1883 **Basu, G. C.**, 196 Bowbazar St., Calcutta—*Free Life Member*
1876 **Bean, William**, Rosebank, Winnipeg, Manitoba
1881 **Blyth, A. H.**, Frankfield, Manitoba
1851 **Bogie, John**, Auckland, New Zealand
1876 **Brown, J. H.**, Waiioa, New Zealand
1864 **Brydon, James**, New Zealand (late Galloway)
1879 **Brydone, W. S.**, Dunedin, New Zealand
1874 **Burn, Forbes**, Waipukuran, Hawkes Bay, New Zealand—*Free Life Member*
1879 **Cantlie, Charles A.**, Natal
1850 **Christie, A.**, Glencairn, Dipton, Southland, New Zealand
1868 **Craig, the Hon. R.**, Chapelton, Jamaica
1870 **Craig, Robert**, South Africa
1872 **Currie, James J.**, Blinkbonny, Birtle, Manitoba
1894 **De la Mothe, Joseph T.**, Grand Bacolet Estate, St Andrew's Parish, Grenada, West Indies—*Free Life Member*
1888 **Drieberg, Christopher**, Colombo, Ceylon—*Free Life Member*
1894 **Duff, J. K. Mackenzie**, South Africa
1870 **Gordon, R. W.**, British Columbia (c/o John Gibson, Howford, Peebles)
1855 **Graham, H.**, Auckland, New Zealand
1874 **Hamilton, W. C.**, Carrodale, Regina, Canada
1868 **Hardie, William H.**, Gamboola, Casterton, Victoria, Australia
1884 **Harris, Richard H.**, Woodside, Papatoitoi, Auckland, New Zealand
1880 **Hoggan, Andrew, jun.**, Queensland
1880 **Holmes, The Hon. Matthew**, Cintra, Dunedin, New Zealand
1891 **Irving, R. J.**, West Australian Pastoral and Colonization Co., Ltd., Kojunup, West Australia—*Free Life Member*
1864 **King, David**, Dunedin, New Zealand
1875 **Leithhead, James**, Mokoia, Woodville, Hawkes Bay, New Zealand
1885 **Lowrie, William**, Prof. of Agriculture, Roseworthy, South Australia—*Free Life Member*
1885 **Macdonald, A. C.**, Department of Agriculture, Grahamstown, Cape of Good Hope—*Free Life Member*
1891 **M'Dougal, Jas.**, Bonnyrigg, St Andrews, New Zealand
1871 **M'Dougall, J. W.**, Peninsular Cottage, Atherley Junction P. O., Ontario, Canada
1859 **Mills, G.**, Glenmona Park, Bung Bong, Victoria
1883 **Mollison, James, jun.**, Deputy Director of Agriculture, Poona, Bombay, India
1886 **Moos, N. A. F.**, Bombay, Poona—*Free Life Member*
1878 **Mundell, Walter**, Tourisfield, ,Brandon, Manitoba
1884 **Murray, W. J.**, Tweedsmuir, Richmond, North Queensland
1888 **Mutter, Major J. M.**, Somenos Ranch, Somenos, E. and N. Reg., Victoria, B.C, Canada
1875 **Pringle, A. T.**, 42 Market Street, Sydney, N.S.W.
1877 **Pudney, R. L.**, Dookie Farm School, Cashel, Victoria, Australia—*Free Life Member*
1859 **Robertson, W. M.**, 32 Bedford Street, Port Hope, Canada
1875 **Scobie, N. F.** Feorlig, Fort-Macleod, N.W.T., Canada
1880 **Scott, Charles**, South Africa, care of John Scott, Detective Department, Central Police Chambers, Glasgow
1892 **Scheult, Louis C.**, Santa Rosa, Arima, Trinidad—*Free Life Member*
1873 **Turner, Peter**, Balsam Grove, Drumquin, Ontario, Canada
1867 **Walker, J.**, Grassmere, Stonewall, Winnipeg, Manitoba
1862 **Walker, John**, Vergelegen, Rosebank, Cape Town
1874 **Walker, R. B.**, Queensland
1865 **Whyte, James**, Waimea Road, Nelson, New Zealand
1879 **Wilson, John, jun.**, Gilbrea, Oakville, County Halton, Ontario—*Free Life Member*
1858 **Wotherspoon, Archibald**, West Oxford, Canterbury, New Zealand

FOREIGN COUNTRIES.

Admitted

1880 **Aalvik, E. A.,** Ostenso, Hardanger, Norway

1882 **Alexander, A. S.,** Evanton, Illinois, U.S.A.—*Free Life Member*

1876 **Anderson, R. Lang,** Manager, The Aboukir Company, Limited, Ramleh, Egypt—*Free Life Member*

1864 **Arbuthnott, Hon. Mrs,** Norway

1881 **Auld, R. C.,** Bishop Crescent, Chicago, U.S.A.

1868 **Baird, Arthur E.,** Brussels

1842 **Booth, James G.,** Seed Merchant, Hamburg

1878 **Bramwell, John,** River Plate Trust Loan and Agency Co., Avenida de Mayo, Buenos Ayres—*Free Life Member*

1871 **Bruce, George C.,** Staunton, Virginia, U.S.A

1864 **Cotesworth, Robert,** Cannes, France

1875 **Crerar, Donald,** Estancia San Alonzo, Estacions Bavio, F.C. Ensenada, Buenos Ayres

1883 **Croll, Thos.,** North Western Sledge Co., Millwaukie, Wisconsin, U.S.A.

1874 **Cruickshank, George,** Chicago

1876 **Donaldson, Alexander,** 54 Avenue Wagram, Paris

1880 **Dundas, T. G.,** 39 North State Street, Chicago

1876 **Fleming, D. G.,** Hacienda de San, Isidro, Villa Coronads, Jiminez, Chihuahua, Mexico

1855 **French, J.,** Sortkjeer, Fredrickshaven, Denmark

1873 **Giglioli, Italo,** Professor of Agricultural Chemistry, Portici—*Free Life Member*

Admitted

1871 **Heggie, Henry,** Roseburg, Douglas Co., Oregon, U S.

1890 **Kerr, James,** The Aboukir Company, Limited, Ramleh, Egypt—*Free Life Member*

1896 **Linton, Andrew,** College of Agriculture, Ghizeh, Egypt—*Free Life Member*

1876 **Logan, J. W.,** M.I.Mech.E., Representative, P.O. Box 2037, Marshall's Buildings, Johannesburg, S.A.R.

1879 **Mackenzie, Murdo,** Trinidad, Colorado, U.S.A.

1883 **Macpherson, John,** 3848 G. Street, San Diego Co., California, U.S.A.

1860 **Mein, N. A.,** Hotel de Emperoure, Boulevard, Dunbanchago, Nice

1861 **Mitchell, David,** Dalton, Otterlail County, Minnesota, U.S.

1861 **Morison, James,** Topeka, Kansas

1878 **Nonnen, J. E.,** Norway—*Free Life Member*

1866 **Shiels, George,** Monett, Mo , U.S A.

1887 **Steele, Daniel,** Agricultural Manager, Lake Copais Company, Ltd., Athens Agency, Athens, Greece—*Free Life Member*

1869 **Tweeddale, George W.,** Ivy Hill, Warminster, Nelson County, Virginia, U.S.

1871 **Tweedie, Richard,** The Forest, Clydesdale Stud Farm, Douglas, Kansas

1895 **Vuigner, Raymond,** 46 Rue de Lille, Paris

1885 **Wallace, Williamson,** Egyptian College of Agriculture, Ghizeh, Cairo, Egypt

1852 **Watson, William,** Beecher Wills, Illinois, U.S.

MEMBERS WHOSE RESIDENCES ARE UNKNOWN.

[*Members knowing the present Address of the following Gentlemen, or being aware of their Death, will please communicate with the Secretary, 3 George IV. Bridge, Edinburgh.*]

Admitted
1870 Aitchison, Peter (late West Garleton, Haddington), America
1869 Aitken, Robert. late Kilmany, Cupar-Fife
1883 Allan, Gavin, late 54 Old Dumbarton Road, Glasgow
1893 Amos, John, late Alderston, Haddington
1879 Anderson, John, late Castlehill, Blairgowrie
1896 Anderson, John R., late Bon Accord Works, Aberdeen
1870 Anderson, John S., late Dalhousie Mains, Dalkeith
1880 Balfour, J. H., late 7 Glencairn Crescent, Edinburgh
1883 Bardgett, John, late Edinburgh and Yorkshire College, Leeds—*Free Life Member*
1882 Bertram, A. D., late Korsewell, Carnwath
1883 Bertram, Hugh, late Edinburgh
1882 Bertram, Wm., yr., late Kersewell, Carnwath
1873 Bisset, Hugh, late Pitarrow, Laurencekirk
1870 Blacklaw, Alex. Scott (late Milton of Arbuthnot, Fordoun), Brazil
1873 Bland, Thos., late Greystone, Tallynessle
1883 Boden, W. F., late Kinsteary Lodge, Nairn
1883 Bonallo, W. C., late Clandaboye, Co. Down
1880 Broad, Anthony, late Edinside Road, Kelso
1869 Brodie, Jas. W., late Cloheen, Buttevant, Co. Cork
1878 Brodie, William, late of Bush, Barkerland, Dumfries
1874 Bruce, A. H. T., late of Falkland, Ladybank
1870 Bryan, F. G. D., late 73 Bath Street, Glasgow
1877 Bryce, W. C., late 27 Berkeley Terrace, Glasgow
1861 Brydon, H., late Knockuarling, New Galloway
1877 Burnett, A. E., late 37 Drummond Place, Edinburgh
1882 Burton, Dr M. B., late Orwell, Lindley, Huddersfield
1870 Cairns, John, late Fernbank, Heaton Chapel, Stockport
1882 Cameron, Donald, late Mossfield, Oban
1862 Cameron, William, late Factor, Kingussie
1871 Campbell, George, late Rhodes, North Berwick
1878 Campbell, William, late Carterton, Lockerbie
1880 Chaplin, G. Robertson, late of Murlingden, Brechin
1880 Chaplin, Captain T. R., late Lawhead House, Carnwath
1881 Chirnside, John, late 48 Albany Street, Edinburgh
1874 Chisholm, John, late East Kirkland, Wigtown

Admitted
1893 Clark, John G., late Mossburnford, Jedburgh
1872 Clark, John Moir, late Kinchyle, Fitzjohns Avenue, London
1869 Clark, Matthew, late Croftengea, Alexandria
1877 Clench, F., late Robey & Co., Lincoln
1873 Coningham, W. J. C., late High Street, Haddington
1864 Cousland, Jas. (late Banker, Denny), Glasgow
1890 Craig, James, late The Banks, Newdigate, Surrey
1867 Craig, Robert, late Tarbert, Lochfyne
1875 Craig, William, late Old Meldrum
1864 Cunningham, John M., late 154 St Vincent Street, Glasgow
1877 Curror, A. H., late Sherman Block, St Paul's, Minnesota, U.S.A.
1874 Dallas, A. G., 10 Tervor Terrace, London, S.W.
1860 Dalziel, Alexander, late Glenwharrie, Sanquhar
1875 Dangerfield, Edward (late Balboughty, Perth), U.S.A.
1887 Deans, John, late Fernbank House, Auchtermuchty
1884 Dick, John P., late Killelan House, Campbeltown
1887 Don, H. G., late The Lodge, Fingringhoe, Colchester
1877 Donald, Andrew, late Longnewton, Gifford
1883 Dowall, J. P., late Kelly Bleachfield, Arbroath
1867 Downie, William, late Kinbroom, Rothienorman
1864 Drummond, John, of Balquhandy, late Guilton Rectory, Wingham, Kent
1873 Drysdale, David, late Lornshill, Alloa
1895 Dudgeon, Alexander Harper, late Woodlands, Dingwall
1874 Duff, Thomas, late Manor House, Sidmouth, Devonshire
1868 Duncan, James (late Killichonan, Rannoch), New Zealand
1879 Duncan, John, late Tilney, St Lawrence, King's Lynn
1882 Duncan, Robert, late Berwick Farm, Stamford River, Essex
1865 Farquharson, J., late 1 Abbotsford Place, Aberdeen
1870 Ferme, Charles, late Blackhall, Tulliallan
1869 Ferme, G., late 104 Rosendale Road, W. Dulwich, S.E.
1870 Finlay, Kirkman, late of Dunlossit, Islay
1870 Fisher, John, late Knells, Carlisle
1870 Forbes, C. W. L., late Aberfeldy
1873 Fraser, H. N., late Tembain, Grey Town, King William Town, Cape Colony
1875 Gemmell, John, late Glespinside, Douglas
1875 Gibson, Francis, late Oatfield, Drem

Admitted
1871 Gibson, J., late 34 Abbotsford Place, Glasgow
1875 Gilchrist, Wm., late Knivocklaw, Loudoun
1873 Glendinning, G. P., late Dalmeny Park
1875 Gordon, A. Hay, late of Mayen, Huntly
1866 Gordon, Christ., late Cannerie, Parton
1885 Gordon, James G., late Elmwood, Inverness
1863 Gordon, Thomas Dempster, late of Balmaghie, Castle-Douglas
1890 Gourlay, Henry, late Balingry House, Dundee
1869 Greig, P. M., late 56 Inverleith Row, Edinburgh
1878 Grieve, Gilbert, late Cardiff
1875 Haig, Wm. (late North St., St Andrews), Australia
1861 Hain, David, late Barremman, Clynder
1871 Hain, Thomas, late Glasgow
1861 Hamilton, Daniel, late 66 Hutchison Street, Glasgow
1876 Hannay, Robert, late Bridge of Allan
1871 Hardie, Charles, late Primrose, Dunfermline
1862 Hendrie, John, late 74 Bath Street, Glasgow
1878 Hope, William James, late East Barns, Dunbar
1871 Horn, John, late of Thomanean, Milnathort
1887 Howie, Archibald, late Rosebery, Gorebridge
1871 Hume, George, late 9 Inveresk Road, Musselburgh
1868 Hutton, Arthur, late Lorton, Tottenhall, Cheshire
1865 Inglis, Peter, late East Pilton, Ferry Road, Edinburgh
1863 Jack, Michael, late Peggy's Mill, Cramond
1858 Jamieson, D., late Auchmithie Mains, Arbroath
1878 Jardine, A. M., late Kilnwick Hall, Cranswick, Hull
1890 Kennard, Cecil, late Tormore, Broadford, Skye
1869 Kerr, James, late Barrhills, Kilbirnie
1876 Kilgour, Robert, jun., late Ardlin, Ellon
1881 Lang, Hugh, late 11 Kew Terrace, Hillhead, Glasgow
1868 Lawson, George Stoddart, late Edinburgh
1867 Lawson, Thomas, late Sandyford, Kirriemuir
1863 Lee, John, late East Coates, Largo
1884 Lindsay, James (late Wester Happrew, Stobo), Australia
1863 Livingstone, T. L. F., late of West Quarter, Falkirk
1865 Lorimer, J., late Achrossan, Tighnabruaich
1883 Lumsden, T. W. M., late Balharg, Meigle
1890 Lyall, Robert J., late Powis, Montrose
1870 McAdam, J. N., late High Trees, Marlborough
1884 M'Cowan, George, late Glenmanno, Penpont, Thornhill
1872 Macfarlane, John, late 10 Ann Street, Hillhead, Glasgow
1874 M'Gregor, R., late Fern Cottage, Nairn
1883 Mackenzie, Colin Lyon, late St Martins, Braelangwell, Invergordon
1868 MACKENZIE, Sir Jas. D., of Scatwell, Bart., late Dingwall
1871 M'Laren, James, late 182 Hope Street, Glasgow
1874 Macleod, D. D. M'L., late Nairn

Admitted
1871 M'Lellan, David, late of Marks, Kirkcudbright
1860 Macpherson, John (late Killihuntly, Kingussie), Ontario, Canada
1876 M'William, Mrs, late Aberdeen
1882 Main, Robert J., late Home Farm, Acton Burnell, Shrewsbury
1864 Marr, J. A., late of Alderston, Mid-Calder
1847 Marshall, J., late Clebrig, Lairg
1886 Maxwell, Wellwood, late of The Forest, New Galloway
1885 Menzies, John G., late 6 Grosvenor Crescent. Edinburgh
1873 Michael, James, late Dunmore, Stirling
1873 Miller, C. W., late Wellwood, Bridge of Allan
1855 Milne, A., late 98 Rosemount Viaduct, Aberdeen
1893 Milne, John, late Annfield, Cardenden
1874 Mitchell, Andrew, late Royal Bank Buildings, Inverness
1894 Mitchell, James S., late St John's Well, Fyvie
1870 Mitchell, Joseph M., late Burnscairth Green, Dumfries
1874 Mitchell, Wm., late North Ossemsley, Lymington
1873 Mollison, James, late Pavenham, Bedford
1879 Muckersie, Henry, late Drumfin, Dunfermline
1882 Muir, John G., late Anderston Foundry, Glasgow
1862 Muirhead, E. W., late The Hill, Putney, Surrey
1863 Muirhead, George (late Durdie, Errol), London
1886 Mukerji, N. G., late Bhowanipur, Calcutta—*Free Life Member*
1877 Paterson, John, late Meadowspott, Dalkeith
1870 Patterson, Alex., late Lawhill, Auchterarder
1893 Peter, John Stewart, late Lintalee, Jedburgh
1884 Pitcairn, D. D., late 25 The Avenue, Brixton, London
1882 Pollock, John, late Pollockshaws
1867 Pople, H. W., late Royal British Hotel, Perth
1881 Powrie, Archibald, late Lairwell, Perth
1875 Preston, W. C., late Stream, Farnham, Surrey
1863 Primrose, James Thomson, late Sauchland, Ford
1889 Raeburn, Norman, late 49 Manor Place, Edinburgh—*Free Life Member*
1867 Ralston, Andrew W. (late Lagg, Ayr), America
1865 Ritchie, Charles, late Ladoga Lodge, Musselburgh
1870 Robertson, James A. (late Chapel Park, Kingussie), Virginia, U.S.
1870 Robertson, Peter D., late 9 King Street, London
1862 Russell, John, late Saughtonhall Mains, Edinburgh
1889 Russell, Thomas, late Greenhill, Avonbridge
1870 Saunders, R. B., late Hutton Grange, Gisburgh
1864 SCOTT, Lord Charles, late Eildon Hall, St Boswells
1889 Scott, James, late Durness, Lairg
1864 Shand, William (late Crichton, Ford), New York
1850 Shiriff, S. D., late 3 Tantallon Terrace, N. Berwick

Admitted	
1873	Sievewright, William (late Solicitor, Lerwick), New Zealand
1879	Simpson, Alexander, late Inverness
1869	Simpson, George, late 2 Lauder Road, Edinburgh
1871	Simson, Thomas, late Skelpie, Cupar
1875	Sinclair, John, late Fanans, Taynuilt
1863	Slipper, Robert B., late 427 New Cross Road, London
1885	Smith, Arthur, late Oakbank Cottage, Kingsgate, Aberdeen
1862	Smith, George, late Haldane House West, Bridge of Allan
1873	Smith, William B., late 32 Ashchurch Grove, London—*Free Life Member*
1875	Spencer, A., late 160 Hope Street, Glasgow
1862	Steedman, John, late Charlestown, Dunfermline
1870	Stewart, D., late Unthank, Langholm
1864	Stirling, Captain Gilbert, late Royal Horse Guards
1887	Stirling, James, late Tamano, Braco
1885	Syme, David F., C.A., late 31 St Andrew Square, Edinburgh
1873	Thomson, A., late Morton Mains, Lothianburn
1884	Todd, John, late Tinwald Shaws, Dumfries
1878	Turnbull, D., late Brieryards, Hawick
1877	Underwood, Peter, late Mains of Essich, Inverness
1888	Vincent, E. H., late Lauder Barns, Lauder
1861	Wallace, John, late Illieston, Broxburn
1882	Wallace, R. Hedger, late 4 Panmure Place, Edinburgh
1871	Wallace, William, late Newton of Collessie
1872	Watson, Patrick, late Friarstown House, Tullaught, Dublin
1884	Watson, W. H., late Ruthven, Coldstream
1875	Whyte, John, late Lingohouse, St Andrews
1872	Wight, R. B., late Ecclaw, Cockburnspath
1884	Williamson, Alex., late Chesterhall, Wiston, Biggar
1878	Williamson, James, late Greenhead, Wishaw
1872	Wilson, George, late Greenhill, Selkirk
1878	Wilson, William, late Low Barmeston, Washington Station, Durham
1805	Winter, Ramsay, late Ruthven, Coldstream
1883	Winton, Alexander, late Viewhill, Ardersier
1878	Wyatt, S., late Nydie Mains, St Andrews

TOTAL NUMBER OF MEMBERS, 5760.

DIPLOMA HOLDERS, FREE LIFE MEMBERS.

By a By-law passed in 1873, with reference to the Supplementary Charter of 1856, successful Candidates for the Society's Agricultural Diploma are thereby eligible to be elected Free Life Members of the Society.

[illegible] some distinctive title attached to the Diploma, and praying that the title F.H.A.S. (Fellow of the Highland and Agricultural Society of Scotland) be granted to them. The Council acceded to the prayer of the Memorial.

Admitted
1879 Aitken, John M., Norwood, Lockerbie
1882 Alexander, A. S., 216 Clerk St., Chicago
1898 Allan, Robert, Polkemmet, Whitburn
1876 Anderson, R. Lang, Manager, The Aboukir Co., Limited, Ramleh, Egypt
1897 Ashby, S. F., 20 Crosby Road, Birkdale, Southport
1873 Ashdown, A. H., M.R.A.C., Castle House, Shrewsbury

1887 Banerjee, N. N., Calcutta
1883 Bardgett, John, late Yorkshire College, Leeds
1896 Barron, James, The Lodge, Home Farm, Tyburn, Birmingham
1883 Basu, Giris Chandra, 196 Bowbazar St., Calcutta
1884 Benson, R. A., Duchy of Cornwall Office, Liskeard, Cornwall
1885 Birch, Walter de Hoghton, Kerry, Montgomeryshire
1893 Borland, John Kennedy, North Balloch, Ayrshire
1878 Bramwell, John, River Plate Trust Loan and Agency Co., Avenida de Mayo 645, Buenos Ayres
1891 Brown, John, Hillhead Farm, Airdrie
1873 Browne, Colvile, M.R.A.C., 2 Plantation Cottages, Hextable, Kent
1873 Brydon, Robert, The Dene, Seaham Harbour
1896 Burkitt, William, Grange Hill, Bishop Auckland
1874 Burn, Forbes, Waipukuran, Hawkes Bay, New Zealand
1882 Buttar, Thomas A., Corston, Coupar-Angus

1873 Campbell, George, Kilkea, Mageny, Co. Kildare
1892 Campbell, J. R., Yorkshire College, Leeds
1885 Campbell, Robert J., Cuil, Castle-Douglas
1879 Cannon, James, Urioch, Castle-Douglas
1878 Carr, Robert, Chestwick Cottage, Beal, R.S.O.
1887 Carrington, George, M.R.A.C., Missenden Abbey, Great Missenden, Bucks
1884 Clinton, W. E., Pelham, Moorcourt, Stroud
1891 Coward, T. A., Eden Town, Carlisle
1890 Crabtree, Henry, 2 Rochdale Road, Heywood
1879 Craig, John, Innergeldie, Comrie
1880 Craig, Wm., Gwydyr House, Crieff
1898 Cryer, John, 172 St Leonard's Road, Girlington, Bradford

Admitted
1894 Daine, Herbert S., 7 Hyde Park Place, London, W,
1887 Davies, Edward Smith, Atchley, near Shifnal, Shropshire
1894 De la Mothe, Joseph, Grand Bacolet Estate, St Andrew's Parish, Grenada, West Indies
1886 Dickson, Thos. A., Estate Office, Overstone Park, Northampton
1895 Dixon, Albert Alex., Tanwood House, Chaddesley Corbett, near Kidderminster
1888 Drieberg, Christopher, Colombo, Ceylon
1892 Duncan, James L., Birgidale, Knock, Rothesay
1878 Dunlop, Andrew T. L., Morriston, Maybole

1873 Eley, Rev Dr Wm. Henry, Etchingham Rectory, Hawkhurst, Kent
1873 Elliot, Prof. Thomas John, M.R.A.C., The Pebbles, Glebe Lands, Hunstanton, Norfolk
1882 Ensor, Thomas Henry, 54 South Street, Dorchester

1886 Faber, Alfred D., Belmont, Ilfracombe, Kent
1876 Ferguson, Archd. A., 196 High Street, Portobello
1891 Fleet, W. J., 6 N.E. Circus Place, Edinburgh
1891 Forbes, A. C., The Home Farm, Baward, Calne, Wilts
1894 Forrester, James John, Bryanston Blandford, Dorset
1895 Fraser, Alex., Earnside, Alves, Forres
1896 Fraser, Miss Margaret N., Isle Farm, Whithorn
1898 Fraser, Sam., 12 Gilmore Street, Shaw Heath, Stockport

1885 Gibb, Robert Shirra, Boon, Lauder
1873 Giglioli, Italo, M.R.A.C., Portici
1889 Gilchrist, D. A., University Extension College, Reading
1873 Goddard, H. R., M.R.A.C., Fairfield, Illogan, Redruth
1894 Goodfellow, Alex., High School, Kelso
1889 Gordon, Robert, Gordonston, Clatt, Kennethmont
1881 Gover, Lawford D., 30 Bernard Street, Russell Square, London, W.S.
1895 Greenwood, Thomas, Cononley, *viâ* Keighley, Yorks
1892 Greig, Robert Blyth, Cheshire Agricultural and Horticultural School, Holmes Chapel

Admitted
1898 Gwillam, Robt., Agricultural College, Aspatria

1898 Hacking, Thos., 50 Beddington Street, Nelson, Lancashire
1887 Haig, Robt., Dollarfield, Dollar
1883 Hamilton, H. W., Lilleshall, Newport, Salop
1884 Hardy, C. W. L., Gittesham, Honiton
1878 Henderson, John, Estate Office, West Dean, Chichester
1874 Henderson, Richard, Portland Estates Office, Kilmarnock
1881 Henderson, W., East Elrington, Hexham
1896 Hewison, Robert, Agricultural College, Aspatria
1873 Hill, Arthur James, M.R.A.C., St Keverne, Harrow-on-the-Hill
1894 Hill, Henry F., Agricultural College, Aspatria
1897 Holm, Alex., jun., Buckland, Betchworth, Surrey
1898 Home, J. H. Milne, Caldra, Duns
1886 Hooper, Cecil H., Highlands Farm, Swanley, Kent
1897 Howie, James L., Harris Institute, Preston
1879 Hunt, A. E. Brooke, Holmsley, Slough, Bucks
1895 Hurley, George, County Technical Office, Stafford

1888 Inman, A. H., care of Glyn, Mills, Currie, & Co., 67 Lombard Street, London, E.C.
1891 Irving, Robert James, West Australian Pastoral and Colonisation Co., Limited, Kojonup, West Australia

1890 Jeffrey, John J., Blackaddie, Sanquhar
1896 Johnstone, James D., Orange Lane, Montrose
1893 Jones, C. B., University College of North Wales, Bangor
1873 Juckes, R. F., M.R.A.C., Harley, Much Wenlock

1875 Kennedy, William, M.R.A.C., Lewes and County Club, Lewes, Sussex

1889 Ledingham, J. K., Slap, Turriff
1898 Leslie, John, Kininvie, Mannofield, Aberdeen
1896 Linton, Andrew, College of Agriculture, Ghizeh, Egypt
1891 Lister, Joseph, Little Broughton, Carlisle
1885 Lowrie, Wm., Prof. of Agriculture, Roseworthy, So. Australia

1876 Maconchy, John Arthur, M.R.A.C., Kildare Street Club, Dublin
1878 M'Connell, Primrose, Ongar Park Farm, Ongar, Essex
1878 M'Cracken, William, Crewe
1898 M'Creath, James, Bosvigo Farm, Truro
1885 Macdonald, A. C., Department of Agriculture, Grahamstown, Cape of Good Hope
1886 M'Minnies, Henry H., Farington, Preston
1887 Maitland, Harry Reid, Muiryfold, Grange, Keith
1884 Malcolm, John, M.R.C.V.S., Birmingham
1880 Martin, Wm., Dardarroch, Dumfries
1897 Mason, William G., Marsh Grange, Kirkby-in-Furness, Carnforth
1889 Middleton, T. H., University College of Wales, Aberystwith
1873 Milne, John, Inverurie
1886 Moos, N. A. F., Poona, Bombay

Admitted
1888 Muir, James, South Haven, Beach Road, Weston-Super-Mare
1886 Mukerji, Nitya Gopal, late Bhowanipur, Calcutta
1891 Munro, Duncan, 3 Dalrymple Place, Edinburgh
1875 Murdoch, George Burn, M.R.A.C., Gartincaber, Doune
1891 Murray, John, B.Sc., Glencarn, Bridge of Earn
1875 Murray, Robert W. E., Blackford House, Blackford Avenue, Edinburgh

1898 Nobbs, Eric Arthur, 4 Comely Bank, Edinburgh
1878 Nonnen, John Edward, Norway
1873 Norman, Wm., M.R.A.C., Sattenham, Milford, Godalming, Surrey
1882 Norrie, William, Cairnhill, Monquhitter, Turriff

1894 Paterson, John Waugh, 60 John Street, Glasgow
1897 Peet, John O., 5 Argyle Park Terrace, Edinburgh
1888 Perkins, Walter Frank, M.R.A.C., Portswood House, Southampton
1877 Pudney, R. L., M.R.A.C., Dookie Farm School, Cashel, Victoria, Australia
1889 Purefoy, Edward B., Greenfields, Tipperary

1898 Rackham, Stanley, Agricultural College, Aspatria
1889 Raeburn, Norman, 49 Manor Pl., Edinburgh
1882 Reid, Peter, Port Ellen, Islay
1898 Robb, Daniel, South Palmerston Farm, Ochiltree
1896 Robertson, Andrew R., 2 Lorne Terrace, Maryhill
1888 Robertson, Chas. T. A., Little Horringer Hall, Bury St Edmunds
1873 Rome, Thomas, M.R.A.C., Charlton House, Charlton Kings, Cheltenham

1881 Sandison, Marcus, Hempriggs, Wick
1892 Scheult, L. C., Santa Rosa, Arima, Trinidad
1894 Seton, Robert S., Rampyards, Watten, Caithness
1890 Sessions, Harold, Tongdean, Brighton
1878 Sharp, J. J., Ewingston, Gifford
1898 Sim, James, The Temple, Drumlithie, Fordoun
1895 Smith, David Lister, North Eastern County School, Barnard Castle
1882 Smith, E. Hedley, B.L., Whittinghame, Prestonkirk
1888 Smith, J. R. C., Mowhaugh, Kelso
1873 Smith, William B., M.R.A.C., late 32 Ashchurch Grove, London
1892 Solomon, F. O., The Durham College of Science, Newcastle-on-Tyne
1887 Somerville, William, B.Sc., Professor of Agriculture and Forestry, Durham College of Science, Newcastle-on-Tyne
1897 Sproat, Hugh, Lennox Plunton, Borgue, Kirkcudbright
1887 Steele, Daniel, Agricultural Manager, Lake Copais Company, Ltd., Athens Agency, Athens, Greece
1891 Stevens, Alex. Buchan, Mains of Kilgraston, Bridge of Earn
1876 Sutherland, Alex., Rampyards, Watten, Caithness

1895 Thomas, Gwyn Reid, Ivy Cottage, Hillingdon, Uxbridge

Admitted
1883 Tiffen, J. H., M.R.A.C, 4 Grosvenor Terrace, Hull
1894 Tipper, Charles J. R, Slaverton House, Ashburton, Devon
1896 Townshend, Joseph H, Fellougley, Nr Coventry
1898 Trotter, John, 376 Castlehill, Edinburgh

1898 Wade, Thomas, Newcastle West, Co Limerick
1897 Wakerley, Fred, Durham College of Science, Newcastle on Tyne
1896 Walker, Francis P, Upper Gornal, Dudley, Staffs
1873 Wall, G Y, M R A C, Durham
1878 Wallace, Prof Robert, University, Edinburgh
1873 Walton, George Kent, Long Campton Shipston-on Stour, Warwickshire
1894 Ward, Martin Hammond, Col Gamble's Estate Office, Corporation Street, St Helens, Lancashire

Admitted
1883 Watson, H A., U P. Manse, Forres
1881 Weber, F. H, Granthams, Chiddingfold, Godalming
1894 Weir, James, Woodilee Farm, Lenzie
1891 White, W E C, Manor Farm, Beedon, Newbury
1894 Whittaker, John D, 24 Broomfield Road, Chelmsford
1898 Williams, David D, Agricultural College, Aspatria
1873 Wilson, Sir Jacob, M R A C, Chillingham Barns, Alnwick
1892 Wilson, James, jun, The University, Aberdeen
1879 Wilson, John, jun, Gilbrea, Oakville, Ontario
1892 Wilson, William, Goodyhills, Maryport
1896 Wilton, James P, 143 Hartington Road, Sefton Park, Liverpool
1882 Wright, Robert P, Downan, Ballantrae, Ayrshire

Number of Free Life Members, 164

HOLDERS OF FIRST-CLASS CERTIFICATE IN FORESTRY, FREE LIFE MEMBERS.

1895 Annand, John F, Kildrummy Estate, Mossat, Aberdeenshire
1892 Baillie, Wm, The Nurseries, Haddington
1895 Davidson, William, Aldbar, Brechin
1892 Gibson, A H, 5 Crawfurd Road, Edinburgh
1897 Guthrie, Patrick Hugh, 4 Clifton Terrace, Edinburgh
1892 Inglis, Alex, Westwood, Roston
1892 Loney, Peter, 22 George Square, Edinburgh
1892 Menzies, John C, Bankhead Duns
1892 Robertson, William, Blinkbonny, Earlston
1892 Wilson, John Hardie D Sc, F R S E, St Andrews

Number, 10

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